THE INTERACTION OF COGNITIVE LEARNING STYLE AND ACHIEVEMENT
OF SELECTED STUDENTS OF ENGLISH AS A SECOND LANGUAGE

DISSERTATION

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By

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The purposes of this study were (1) to determine if the culture of the student's first language was a significant variable in field-dependent-independent cognitive learning style, and (2) if a student's second language achievement has a significant relationship to variables of grade level, sex, time in an English as a second language (ESL) program, second language proficiency level or cognitive learning style. It was hypothesized that (1) there are significant positive correlations between field-independence and the variables of achievement, proficiency level, and grade level, (2) there are significant positive correlations between second language achievement and proficiency level, grade level and time in an ESL program, (3) there are no significant differences in field-dependence between the sexes or the four cultures of Laotian, Spanish, Tongan, and Vietnamese, and (4) there is no significant difference in the mean achievement score between the sexes.

The sample for this study was composed of sixty-eight secondary ESL students in North Central Texas from four
selected cultures. Criterion measures of learning style were obtained through the administration of the Group Embedded Figures Test (GEFT). Criterion measures of achievement were obtained through the administration of the reading and language subtests of the California Achievement Test (CAT). Pearson product-moment correlations, a multiple linear regression, and a stepwise regression were used to determine the retention or rejection of the hypotheses.

Statistical analyses indicated that (1) a significant correlation existed between field-independence and CAT language scores and second language proficiency levels, (2) reading and language achievement were significantly correlated to second language proficiency levels, and (3) time in an ESL program was significantly correlated to CAT reading scores. Recommendations are made for future research concerned with second language learning of English in relationship to affective learning styles, teaching methods and materials, stage development theory, brain-spurt research, and achievement in other academic subjects.
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CHAPTER I

INTRODUCTION

A goal of the American educational system is to educate every child between the ages of five and twenty-one to his/her maximum competency. Millions of federal and state dollars have been funneled into public education in order that every individual child will receive the maximum benefit from his/her educational experience. Commissions and committees alike have been established throughout the history of education in the United States to ensure that the goals of education are explicit and that every child's needs will be met by the curriculum provided in public schools. As the population within the classroom changes, so do the needs that must be met. The population within the classroom is becoming more and more culturally diverse. Not only is the classroom in Texas changing with the influx of students from northern and eastern states, as well as with students from the neighboring country of Mexico, it is often populated with students from half a dozen or more other different countries, nationalities and cultures. Within the past decade the education of these culturally diverse students has become the focus of local, state and federal concern (Olson, 1984).
Federal and state legislation has created a mandatory program of English as a second language (ESL) for the culturally diverse, and the local districts in Texas have implemented this mandate in a variety of ways to suit the needs of the specific district (Olson, 1984).

Little research has been conducted on this fairly new division of the Texas public school population in relationship to the achievement of these culturally diverse students, the methods of teaching this population, and the learning style of these particular individuals (Deal, 1983; Borg, 1979). They have only recently become an integral part of the Texas public educational system. This study of four selected cultures sought to provide additional information on the relationship of learning style and the achievement of students studying English as a second language. It further sought to determine what differences, if any, occurred in achievement scores between males and females, and whether or not culture was a viable factor. Other considerations of interaction included grade levels, proficiency levels, and length of time in the ESL program.

Statement of the Problem

The present research was a study of the interaction of field-dependent and field-independent cognitive learning style and achievement of students from four selected cultures enrolled in ESL at the secondary level.
Purposes of the Study

The purposes of this study were (1) to determine if the culture of a student's first language was a significant variable in field-independent/dependent cognitive learning style, and (2) if a student's cognitive learning style had a direct relationship to his/her grade level, time in an ESL program, sex, language proficiency level or achievement in English as a second language.

Hypotheses

To carry out the purposes of the study, the following hypotheses were tested.

1. There will be a significant positive correlation between field-independence and achievement in ESL.
2. There will be no significant difference in field-dependence between the ESL students of the four cultures: Laotian, Spanish, Tongan, and Vietnamese.
3. There will be no significant difference in field-dependence between male and female students enrolled in the ESL program.
4. There will be no significant difference in the mean achievement scores between male and female students enrolled in the ESL program.
5. There will be a significant positive correlation between second language proficiency level and second language achievement score.

6. There will be a significant positive correlation between field-independence and the grade level of the students enrolled in ESL with students in grades ten, eleven and twelve demonstrating more field-independence than students in grades seven, eight and nine.

7. There will be a significant positive correlation between achievement and the grade level of the students enrolled in ESL with the students in grades ten, eleven, and twelve exhibiting more achievement than students in grades seven, eight, and nine.

8. There will be a significant positive correlation between field-independence and the proficiency levels of ESL students with field-independent students having a higher degree of proficiency than field-dependent students.

9. There will be a significant positive correlation between achievement and the time in an ESL program with students who have been in the ESL program longer exhibiting more achievement.
Background and Significance of the Study

Much research has been conducted on the cognitive learning style of field-independence/dependence of learners at various age levels. Most of the studies have concentrated on the relationship of field-dependence or field-independence to achievement in a particular subject. Other studies have sought to widen the distinction of field-independent/dependent cognitive learning style of individuals by variables of age, sex, and intelligence quotient. The research of cognitive learning style of students studying English as a foreign language was limited to one study in a Finnish setting (Leino, 1980) where students were using an American developed test. Other second language studies of field-independent and field-dependent learners dealt mainly with Canadians learning French as a second language (FSL) (Bailey, 1983; Krashen et al., 1980). All of these studies neglected to use culture as a variable.

Mrosla (1983) recommended that studies be made to determine whether culture has any effect on field-dependence or field-independence. This (1983) study was limited to determining the differences between field-dependent and field-independent cognitive style of low and high achieving students enrolled in an algebra course in two diverse educational settings. Decker (1983) emphasized that cultural diversity is another element to recognize in
learning styles and that there has not been enough research in this area for educators to teach effectively to the cultural and ethnic diversity of our students. She cites Castaneda (1977), Halverson (1979), Morris (1978) and Ramirez (1974), who have theorized that the Mexican-American youngster and inner-city black youth tend to grow up in cultures that produce primarily field-dependent learning style characterized by an interpersonal orientation in psychological functioning and dependence on others. They tend to be more successful when broad aspects of the curriculum are stressed rather than details, and when the curriculum is more relevant and personalized to fit their view of the world. The literature suggests that cultural values influence the way in which one learns, but few empirical studies have been made to prove this hypothesis.

Leino (1980) reported that Hosenfeld (1975) identified learning strategies of foreign language learners at college and high school level. This study used interviews involving student self-observation and "thinking aloud" as the students performed tasks given to them. It was determined then that the students were capable of observing and describing how they completed foreign language tasks. A case study through interview and observation techniques showed the value of such techniques in helping the individual learner with his/her specific language problems (Hosenfeld, 1979). Similar techniques have been used by
Leino (1980) in a study concerning mathematical thinking and performance processes of Finnish students. Students "thought aloud" and described the way they approached mathematical problems. These techniques were found valuable in getting information on problem solving styles and strategies, but were not conclusive in the relationship of culture and cognitive learning style.

Of the studies in which interactions of learning style were sought, the most numerous seem to concern field-independence/dependence and the learning of different school subjects (Cohn, 1968), very often mathematics (Maher, 1983). According to Leino (1980), Thornell (1977) studied the relationship between the analytic/global (field-independent and field-dependent) dimension of cognitive style and two strategies of teaching concepts of mathematical symmetry. Results showed no significant differences between the two instructional treatments for subjects with the same cognitive style.

Several studies have been made concerning the influence of cognitive style on academic performance. Students who are field-independent are often found to perform better in school than do students who are more field-dependent (Cohen, 1968; Cross, 1976). This idea was also expressed in Tormey-Miller (1981) (Vaidya and Chansky, 1980; Anderson, 1972; Baker, 1970; Colker, 1972; Drummond, McIntire and Mincions, 1976; Erginel, 1972; Kagan & Zahn, 1975; Levine,
1976; Satterly, 1976; Witkin, Moore, Goodenough & Cox, 1977; Renninger & Snyder, 1983; Chester, 1974; Fiebert, 1967); however, research indicates that the evidence in this regard is greatest at the elementary school level and less evident among high school students. This is supported in studies of reading achievement for primary and elementary grades (Estes, 1975; Robinson, 1974); although, Chester (Peterson, 1979) discovered that this relationship disappears before high school. Miller (1981) demonstrated that there was a significant relationship between reading achievement and field-independence on the Embedded Figures Test (EFT) with high school boys. Martens' (1976, 1979) studies with college students revealed no significant relationship on a cognitive style test and reading performance. Coop and Brown (1970) found no difference between college students with field-independent and field-dependent cognitive styles in relationship to teacher-structured presentations and/or independent-problem solving methods. Kaplan (1981) and Owie (1983) conducted similar studies. Gordon and Lang (Davey, 1976) found that a relationship did exist between field-independence and reading abilities of college students.

Although few studies of the adolescents' cognitive learning styles during the middle school years are available (Eiszler, 1983; Gregory, 1976; Snow and Lohman, 1981), it has been suggested by Hudson (1981) that field-independence and field-dependence, as related to developmental stage, is
highly correlated to variables of age, intelligence quotient and sex. This is supported by findings of Flexer and Roberge (1983) and Nummedal and Collea (1981) that showed the relationship between formal reasoning and the students' field-independence. It is evident that more research is needed for this age group enrolled in secondary schools.

The belief that males are superior to females in mathematics has been challenged in recent years. As Mrosla (1983) explains, in previous research the developmental aspect of sex differences in performance has intrigued both educators and psychologists (Biehler & Snowman, 1982; Fennema, 1979; Fennema & Sherman, 1978; Hoffman, 1972; Witkin et al, 1962). Until adolescence, females and males show no more difference in mathematics achievement than in general intelligence. In early teens the performances of females begin to decline in relation to males (Wood, 1976) until, by the end of compulsory schooling, there is a dramatic difference between the sexes in their mathematical competence (Badger, 1981; Fairweather, 1976). Fennema and Sherman (1977) found significant differences attributable to school district and age, but not to sex in their sample of students in grades six to eight. This study illustrates that the discrepancy between the sexes is diminished following training. This is, females generally score higher after exposure to space-related activities (Connor & Serbin, 1980; Goldstein & Chance, 1965; Vandenburg, 1975).
Gallagher's (1965) research with exceptional children (Crandall and Robson, 1960) reported that boys were more likely than girls to be more analytic and independent in their approach to problems; furthermore, that it was unimportant whether the differences were genetically or environmentally based. They established that the mere presence of a difference in sexes in cognitive learning style was important and must be recognized in educational studies.

Witkin (1977) presented evidence for sex differences in field-dependence. Bergum & Bergum (1980) add to the cumulating evidence that biological sex in and of itself is in fact not a variable in field-dependence. The Bergums suggest this may be a result of the changing socialization process that has taken place in the United States in the last twenty years. This socialization process may not have affected the cultures of the ESL students and thereby may not affect the relationship of field-independence or field-dependence and sex of these students.

Research reviewed by Leino (1980) expressed that correlations between cognitive style dimensions and achievement in different school subjects were significant (Satterly, 1979; Hunt, 1979). The subject studied most with a high correlation of field-independence/dependence and achievement was mathematics, including geometry, algebra, and general math. Other related studies, as reported by
Leino (1980), have been made explaining the relationship of field-independence/dependence and various school subjects including foreign language. Grieve et al (1971) found that extreme global or field-dependent males receiving expository instruction had significant difficulty in applying knowledge to new situations. Grippin et al (1977) examined the interaction of field-independence/dependence, dogmatism and programmed Russian vocabulary learning under varying prompt conditions. They found that the mean criterion scores of field-independent and open-minded subjects were higher than those of field-dependent and closed-minded subjects. Hansen and Stansfield's (1980) study indicated positive and significant correlations at the .05 level between the students of greater field-independence and higher achievement levels on six measures of Spanish proficiency. Zampogna et al (1976), as related by Leino (1980), studied the relationship between student learning style and traditionally structured or individualized foreign language instruction. The results showed that students with high conceptual-level scores, or field-independence, expressed a preference and need for an individualized environment, while students with low conceptual-level scores, or a high degree of field-dependence, expressed a preference and need for a traditional environment. Lepke (1977a, 1977b, 1978) concluded that there is a significant and demonstrable relationship between learning styles and foreign language
achievement. Harper's (1977) study of students of French, as reported in Leino (1980), shows significantly higher performance scores for students who studied the way they preferred than those who had no choice. Contrary to these studies, Leino (1980) found that field-independence or field-dependence, as measured by the Group Embedded Figures Test (GEFT), was related to school achievement, but with the exception of foreign language (English) in a Finnish setting with which the correlation was not significant. This may have been due to the fact that achievement was measured by the grades assigned by the teacher. Teacher assigned grades are rather global in nature when compared to achievement or competency tests.

Even less research has dealt with the cultural aspect involved in learning styles. The cultures involved in most studies have usually been limited, as reported by Decker (1983), to the youths of the black, Mexican-Americans (Ramirez, 1974; Castaneda, 1977; Halverson, 1979), and the American Indians in the United States (Morris, 1978). When researched by Hansen and Stansfield (1980, 1982), culture was limited to the students studying French as a second language (FSL) in Canada (Tucker et al, 1976; Bialystok & Frohlich, 1977, 1978; Naimon et al, 1978).

The project conducted by Naimon et al (1978) indicated that field-independent and field-dependent students appeared to process and produce linguistic structures in different
ways. This group found that greater field-independence was significantly related to better performance on imitation and listening comprehension tasks, especially at the more advanced stages of French study. Tucker et al (1976) did not find this same relationship for younger students on listening comprehension, reading comprehension, or oral production tasks. However, this investigation did link greater field-independence to better performance on an achievement test of general language skills. By contrast, the findings of Bialystok and Frohlich (1977, 1978) attributed a very minor role in second language learning to field-independence. These investigators concluded that field-independence/dependence was not strongly predictive of success on the second language reading, listening, and writing tasks which they had selected.

These various research efforts present conflicting evidence about the relationship of field-independence or field-dependence upon learning of a second language in the classroom. Due to the limited amount and tentative nature of previous research examining field-independence/dependence and second language learning, more research data is needed in order to accommodate these stylistic learner differences.

The present study focused upon the identification of the field-independence or field-dependence of the culturally different students from four selected language groups. The intent of the study was to determine the relationship
between the students' cognitive learning style and the
students' grade level, time in an ESL program, sex,
proficiency level and achievement in ESL. Such
relationships have been shown in various studies for native
speakers of English in fields of mathematics, reading and
science (Mrosla, 1983; Leino, 1980; Tormey-Miller, 1981;
Vaidya & Chansky, 1980); however, other initial research
efforts offer mixed and somewhat inconsistent conclusions
about the influence of field-independence/dependence upon
classroom learning of another language (Hansen & Stansfield,
1980). Most people of any culture acquire a basic
competence in their first language in a very brief time
during early childhood (Dale, 1976), but learners of a
second language display great variability in the level of
proficiency they attain and the time it takes to attain that
proficiency. Neufeld (1979) said the ultimate goal in
second language learning research was to develop a model
that explains how and why students' performances vary in
different language learning tasks. Although instructional
methods and learning environments are factors to consider in
such a model, during the last decade a significant amount of
attention has been focused on the individual learner as a
central element in the complex process of learning another
language. Studies have frequently assessed the relationship
between second language achievement and cognitive learning
style, but have failed to include the highly differentiated
variable of culture, which has been a dominant factor in learning one's native language (Dale, 1976).

The intent of the present study is to determine (1) whether a relationship exists between field dependence or field-independence of the student and the culture of the student and (2) if a relationship exists between culture, field-independence/dependence and achievement scores in second language evaluation techniques. In addition, the present study will (3) determine if a relationship exists between the students' cognitive learning style and the students' sex, time in an ESL program, grade level, and second language proficiency level.

It is hoped that such research will not only reveal important learner differences, but also indicate appropriate instructional methods, techniques and materials that can promote a greater degree of language learning success among culturally diverse students.

Definition of Terms

The following terms have restricted meaning and are thus defined for this study.

1. Cognitive learning style. Cognitive learning style refers to the individual difference in how one perceives, thinks, solves problems, learns, and relates to others. It is concerned with the form rather than the content of cognitive activity (Mroska, 1983).
2. **Field-independence.** Field-independence is one of the most extensively investigated cognitive styles, which refers to an analytical dimension. The field-independent person has a tendency to perceive items as discrete from the field when the field is structured. When the field has little inherent structure of its own, he tends to give it a structure. A field-independent student refers to an individual who is more self-reliant and self-structuring in his psychological functioning and has a greater tendency to structure problem-solving strategies independently.

3. **Field-dependence.** Field-dependence is a cognitive learning style which refers to a global dimension of perception and intellectual processes. The field-dependent person experiences parts of the field as embedded in the background. He perceives the whole field globally in an undifferentiated and unstructured manner. A field-dependent student tends to show a more interpersonal orientation in his psychological functioning and has a greater tendency to ask others for help.

4. **Secondary students.** Secondary students refer to students enrolled in grades seven through twelve of a public school in Texas, including junior high school, middle school, and high school. It is all inclusive of these institutions whether they exist in a large, average or small school district.
5. **English as a second language (ESL).** English as a second language is the course taught fulfilling the requirements of Title 19, Part II, Chapter 77, Subchapter R of the Texas Administrative Code and Statutory Citations, including any bilingual programs that might exist in conjunction with this course.

6. **Academic achievement.** Academic achievement in a foreign language in this study refers to the most recent scores attained by students on the California Achievement Test (CAT), including only the subtests of language skills and reading skills.

7. **Proficiency levels.** Proficiency levels in the second language refer to the three levels: Non-English Proficiency (NEP), Limited English Proficiency (LEP), and Fluent English Proficiency (FEP), which a student attains by the scores received on the Language Assessment Scales II (LAS II) or the (IDEA) Individualized Developmental English Activity Oral Language Proficiency Test (IPT II). More specifically, the levels are identified in terms of actual skills, as defined in each test manual. For numerical calculations the proficiency levels were converted to scores of 1 to 4 with the following values: NEP = 1; LEP = 2 or 3; and FEP = 4.

8. **Culturally different or culturally diverse students.** Culturally different or culturally diverse students are defined as those students whose first language
is a language other than English and who are presently enrolled in a specified ESL class.

9. **Culture.** Culture is defined on the basis of a student's native tongue or language and his geographical origin. His language-culture area will be defined as Vietnamese, Laotian, Spanish, or Tongan.

10. **Time in an ESL program.** Time in an ESL program is defined as the number of months the student has been enrolled in this school district's ESL program since the establishment of the ESL program in 1983.

**Limitations**

One limitation which must be recognized was that students' cognitive learning style was classified as field-independent/dependent on the score of only one instrument, the Group Embedded Figures Test (GEFT). Another limitation was the academic achievement level which was based exclusively on tasks of reading comprehension, listening comprehension, and multiple choice responses of the California Achievement Test (CAT). Language skill levels may have been below the fortieth percentile of national norms (one criteria for participation in an ESL class) which naturally limits the range of scores. The students' original written responses had not been taken into account in this study. Due to the subject matter, other limitations include varying ages, possibly from eleven to
twenty-one, and different size sample groups representing each culture. In addition, the culture referred to as Spanish was all inclusive of Spanish speakers from Mexico, Argentina and Puerto Rico.

Instrumentation

The instruments used in this study included the Group Embedded Figures Test (GEFT), the California Achievement Test (CAT), the Individualized Developmental English Activities (IDEA) Oral Language Proficiency Test (IPT II), and the Language Assessment Scales II (LAS II).

The Group Embedded Figures Test (GEFT) was administered to the subjects to determine field-dependence and field-independence. The GEFT is a perceptual test which tests an individual's tendency to function at a more differentiated or less differentiated level via perception. The level of perceptual differentiation characterizes an individual's perceptual style as field-dependent or field-independent.

Perceptual styles are characteristic, self-consistent modes of functioning which individuals show in both perceptual and intellectual activities. This dimension of cognitive functioning represents contrasting ways of approaching a task and may be referred to as a global versus analytical dimension of perception (Witkin, 1962).
The field-dependent student and the field-independent student each approach a task in a different way. The field-dependent student requires the isolation of an essential element from the context and usage in a different context. The field-dependent person will be highly influenced by the interpersonal social context.

In contrast, the field-independent student approaches a problem in an analytical way and tends to organize a field even when the field may have relatively little inherent structure. A field-independent person gives evidence of a separate identity from his social context. He relies on internal sources rather than the social surroundings to form judgments, make decisions and solve problems (Witkin, 1962).

The GEFT consists of eighteen simple, geometric forms hidden within more complex figures. The subject is required to locate the simple figure within a prescribed period of time. Scoring of the GEFT yields a single score between zero and eighteen. Any score of nine or less is an indicator of high field-dependence. A score of ten or higher indicates low field-dependence, or a high field-independence, as the case may be.

Reliability of the GEFT has been indicated in a study of different ages of both males and females. Split-half reliability, computed by the Spearman Brown prophecy formula, was found to be .82 for both males and females.
Validity for the GEFT and the original Embedded Figures Test (EFT) is suggested by correlating scores from these instruments with scores on the Articulation of Body Concepts (ABC). Performance on the GEFT, when correlated with EFT scores, yielded a Pearson R of .71 for males and .55 for females (Witkin et al, 1971).

For this study scores from the GEFT were correlated with reading and language scores from the California Achievement Test (CAT) and the proficiency levels obtained from the IPT II or the LAS II. The scores from the GEFT were further correlated with the cultures, grade levels, and sex of the participants.

The California Achievement Test (CAT) is an achievement test for "estimating the extent to which an individual student is achieving in accordance with his or her age, grade, sex, and academic aptitude." The correlations of the Short Form Test of Academic Aptitude (SFTAA) with CAT total language scores are only in the .70's. Reliability is reported appropriately within each grade and is in acceptable ranges (the language total shows K-R 20 coefficients in the mid .90's, and interform agreements in the high .80's)(Buros, 1974). The manuals provide conversion tables to grade equivalent, to Achievement Development Scale Score (ADSS), to percentile rank, and to stanine scores (CAT, 1978).
Clearly, from the widespread use of the CAT, many educators have judged its content and face validity to be high; and Page (1974) agrees, so far as the language sections are concerned. The CAT provides a sort of concurrent validity in the prediction of performance.

For this study, the percentile scores from the reading and language sections of the CAT were correlated with the scores from the GEFT, and proficiency levels from the LAS II or IPT II. These same percentile scores were further correlated with students' grade level and time in an ESL program. The mean score of the CAT for males was also compared to the mean score of the CAT for females.

The secondary IDEA Oral Language Proficiency Test II, (IPT II - English) was created to be a companion test to the IPT I, which was written in 1978 and published in 1979. The IPT II was developed expressly to assess the oral language skills of students in grades seven through twelve. Together the tests cover the K - 12 spectrum. As is true of the IPT I, the IPT II not only evaluates the oral language proficiency of students, thereby providing Non-English Proficiency (NEP)/ Limited English Proficiency (LEP) designations, but also yields diagnostic information for program planning (Ballard, 1979).

The IPT II was published in September of 1983. It yields diagnostic information as well as proficiency data. It should be remembered that this data refers to proficiency
in oral language only. The IPT II does not assess reading and writing skills or subject matter content.

A review of the construct validity data substantiates and supports the IPT II's underlying constructs. There is a positive, significant correlation between time in country and language proficiency. Students build upon previous knowledge/concepts/skills. They add to and refine their corpus of language with time, experience, exposure and structure being facilitating factors (Dalton, 1979).

The IPT II has been proven to be effective in the identification and classification of Non-English, Limited English and Fluent English Proficient students. The IPT II demonstrates high reliability. The consistency of scores was evident in a Test/Retest Study, in the Change Score Analysis, and in the Split-Half Test of Reliability. The Pearson's Product Moment Correlation Coefficient statistic was used as the Reliability Coefficient. The correlation between IPT II results (Test/Retest) for Form A, first and second administration, the Pearson's R was 0.42 with significance at the 0.0091 level. The correlation between IPT II results (Test/Retest) for Form B, first and second administration, the Pearson's R was 0.72 with significance at the 0.00001 level. This correlation implies high inter-rater reliability as well as high Test/Retest reliability (Dalton, 1983).
The Language Assessment Scales II (LAS II) is an individually administered test. The test is composed of five sections: Sound Discrimination, Lexical, Phonemes, Sentence Comprehension and Oral Production.

The test manual proposes a method of establishing inter-rater or interjudge reliability, especially on the oral production section, and provides a tape cassette as a means of standardizing the test on Section I, Sound Discrimination and Section III, Phonemes (Duncan, 1978).

Using a point-biserial correlation between subscale items of the LAS and the subscale total score with a standard error of measure, the following reliability coefficients were determined for the corresponding section of the test: Phonemes .93; Sound Discrimination .80; Lexical .65; Sentence Comprehension .65; and total score .95. Cronbach's Alpha reliability on subscale items and total score were also calculated by ethnolinguistic groups with the following results: 1) Chinese: Phonemes .92; Sound Discrimination .91; Lexical .88; Sentence Comprehension .73; and total score .96; 2) Anglo: Phonemes .88; Sound Discrimination .87; Lexical .56; Sentence Comprehension .66; total .89; and 3) Mexican-American: Phonemes .87; Sound Discrimination .84; Lexical .63; Sentence Comprehension .65; and total score .91. From these various results it is clearly seen that LAS subscales are highly stable or reliable (Duncan, 1983a).
Reliability was also established through a test-retest procedure. With regard to stability of NEP/LEP/FEP classifications, test-retest evidence shows that twenty-six out of twenty-nine students are classified in the same categories. Two of the misclassifications were off by less than one standard error of measurement (Duncan, 1983b).

The LAS II was also examined for content validity, construct validity, criterion validity, and predictive validity. Results of content validity in Sound Discrimination revealed that all items except one were passed by 74 percent of the speakers. All English Phonemes (production) were passed by at least 81 percent of the speakers. Descriptive statistics on the Lexical subscale for LAS II revealed the range of mean item scores was .94 to 1.00 with a subscale total of 19.77, and the standard deviation of .55.

The overall results of the studies examining the LAS II test reach the consensus that the test seems to be a stable set of subscales which, when combined, produce a total score capable of predicting the probability of success in an all-English speaking classroom.

For this study, proficiency levels from the IPT II or the LAS II were correlated with the reading and language percentile scores from the CAT and cognitive learning style scores from the GEFT.
Procedures for Implementation of the Study

Subjects

The population for this study was defined as students from four selected cultures enrolled in an ESL class in a middle-sized North Central Texas school district. The population of ESL students in grades seven through twelve in the metropolitan school district used had enrolled seventy-one students in the selected cultures of Laotian, Spanish, Tongan, and Vietnamese. All ESL students present on the day of testing were administered the GEFT. The number of students tested representing each culture was as follows: Cambodian - 2; Chinese - 3; Korean - 1; Laotian - 25; Portugese - 1; Singhalese - 1; Spanish - 13 (Argentina-1, Mexico-3, Puerto Rico-9); Thai - 1; Tongan - 13; and Vietnamese - 17. Only sixty-eight students whose first language was of the four selected languages (Laotian, Spanish, Tongan, and Vietnamese) and had taken the GEFT were included in this study.

Research Design

A correlational research design was used to address the issues pertinent to this study. Correlations were computed between the multiple variables of sex, grade level, percentile scores on language and reading subtests of the CAT, the English proficiency levels, culture, time in an ESL
program, and the independent variable, field-independence or field-dependence, as assessed by performance on the GEFT to determine the interaction of the independent variable and the multiple dependent variables. Correlations were also computed between the mean of achievement scores of male students and mean of achievement scores of female students. Achievement scores from the CAT language and reading subtests were further correlated with students' proficiency level, grade level, and time in an ESL program.

Procedures for Collecting Data

The test data for the CAT and either the LAS II or IDEAS (IPT II) were available from each ESL student's permanent record since results of these instruments were required for entrance into the program. The achievement of each student was based on results from the most recent administration of the reading and language subtests of the CAT. The proficiency level of each student, NEP/LEP/FEP (1-4), was determined by scores assessed from either the LAS II or IPT II.

A student's cognitive learning style, field-dependence or field-independence, was determined by the administration of the GEFT to each class of ESL students in April, 1985.

The culture or first language of each student was determined by the home language survey form which was also
found in each student's permanent folder, as required by the Texas Education Agency.

All other data including students' sex, grade level, and time in the ESL program were obtained from the Classroom Summary Roster for ESL retained by the Secondary ESL Coordinator of the district.
CHAPTER BIBLIOGRAPHY


Bergum, J. E., and Bergum, B. O. Field dependence, perceptual instability, and sex differences. Paper presented at the Annual Convention of the Southeastern Psychological Association, Oklahoma City, Oklahoma, April 10-12, 1980.


Duncan, S. E. and De Avila, E. A. A convergent approach to oral language assessment, theoretical and technical specifications on the language assessment scales, LAS form A. San Rafael, California: Linguametrics Group, 1983b.


Hansen, J., and Stansfield, C. Field-dependence and field-independence as a variable in second language cloze test performance. A paper presented at the International Conference of Teachers of English to Speakers of Other Languages (16th, Honolulu, Hawaii, May 1, 1982).


Hudson, T. B. The interaction of Piagetian stages of development in early adolescents, IQ levels and other variables in predicting success on a grammar task. A research report from Ohio, 1981.

Jenkins, J. Learning styles: a pivotal point for retention and career decision guidance. A paper presented to the Annual Meeting of the National Academic Advisors Association (Indianapolis, Indiana, October 1981).


Mrosla, J. Differences between field-dependent and field-independent cognitive styles of low and high achieving mathematics students. An unpublished dissertation at North Texas State University, Denton, Texas, August, 1983.


Olson, L. Bilingual students are underserved, E. D. report says. *Education Week*, 1984, 4, 1-11.


Peterson, P., and Janicki, T. Individual characteristics and children's learning in large-group and small-group approaches. A report from the Project on Studies of Instructional Programming for the Individual Students at Wisconsin University, Madison, Wisconsin, April, 1979.


Satterly, D. J. Cognitive styles, spatial ability and school achievement. *Journal of Educational Psychology*, 1976, 68, 36-42.


CHAPTER II

REVIEW OF RELATED LITERATURE

Research in the field of learning is certainly not a new endeavor for the educator or the psychologist. Elements of learning and learning styles have appeared in research literature as early as 1892. These elements have only recently been applied to data-based studies of second language learning. The research concerning the learning of a foreign language has adapted a variety of diverse fields including anthropology, education, linguistics, psychology, ethnography and sociology in order to make theoretical progress of its own. More specifically, second language learning research in these various fields has focused on four basic aspects: the role of input; neurological factors, interlanguage development and socio-affective variables.

Because learning is an internal process, one knows that it has taken place only when there is an observed change of learner behavior of a more or less permanent nature resulting from what has been experienced (Teyler, 1977). According to Krashen (1979a), learning is conscious; it is knowing about a language, or formal knowledge of a language. He further differentiates it from acquisition which is a
subconscious behavior, similar to a child's first language acquisition.

Learning a second language, based on this same premise, has been defined as observed communicative and linguistic competence in the foreign language. This demonstrable behavior includes not only the concept of grammaticality, but also the concept of appropriateness (Briere, 1980; Oller, 1980; Dale, 1976; Hymes, 1972). Linguistic competence is the set of learned principles that a person must have in order to be a speaker of a language. Linguistic performance is the translation of this knowledge into action. It is this learned behavior that includes competence, memory, perception, interferences, and other learning style elements. It is projected that linguistic competence by a second language learner will result in communicative competence. Hymes (1972) introduced the term communicative competence, and explained the concept with considerations of who is saying what to whom in what circumstances and under what conditions. For learning to be observed in second language learners both linguistic competence and communicative competence must be evident.

Testing or observation of communicative competence is still a controversy in research of second language learning (Oller, 1980). Tests or studies must differentiate people who can perform a certain task from people who cannot, or they must differentiate multiple degrees of ability to
perform certain tasks. In either case, the tests produce differences between individuals or between individual performance which is quantitatively the same thing. These differences can be defined in terms of what is called variance. The controversy in regard to communicative competence, is how much of this variance in proficiency testing or other testing can be attributed to learning the language and not to other consequences. Research in learning a second language has developed from speculative and intuitive studies to data-based studies of observable, quantifiable and replicable behavior.

An illustrative study of both bicultural and bilingual learning was conducted by Lin and Stanford (1983). This study was conducted with a selected group of twenty-four upper middle-class Chinese immigrant children in Edmonton, Alberta, Canada. The object of the study was to examine the general patterns of language behavior of the children and to correlate these patterns with family sociolinguistic factors. The family background and the bicultural and bilingual family patterns were taken into consideration. The importance of education or of learning the English language was highest in ratings on activities by these families. The importance of their children learning Chinese resulted with fifty percent of them rating it 'helpful' or 'enjoyable' and the other fifty percent rating it 'important.' The parents were characterized as being in
favor of bilingualism, which however, they felt was more
difficult to achieve than biculturalism. One of the most
predominant sociolinguistic patterns derived from this study
was that nearly half of the subjects, forty-six percent,
responded to their parents in English while their parents
addressed them in Chinese, and they communicated perfectly
well. They could not be classified as receptive bilinguals
since sixteen percent of the subjects failed to ever respond
in Chinese in the study. Another twenty-five percent could
only use fragmentary Chinese while fifty-nine percent were
almost as fluent in Chinese as in English.

Two different bilingual language development patterns
emerged from this study. The first pattern was that of
subjects who were born in Canada or immigrated before school
age. If the parents of these children insisted that the
ethnic language be used at home, the child's Chinese was
maintained and further developed along with English.
Otherwise, it leveled off or declined, or was even lost.
The second pattern, which was different, was that of
children who immigrated at school age. If the family
continued to use Chinese, the child's Chinese was maintained
as English developed. In the one case where, because of the
family's anxiety about the child's English, Chinese was not
often used at home, the child's Chinese deteriorated.

This study indicated the tremendous influence of the
peer group on the bilingual child as well as the influence
of age when the second language and culture was introduced. It also revealed numerous questions to be asked about second language learners.

Studies Related to the Role of Input

Most second language learning research has been focused in one of four basic directions. One direction was to study the role of input. This has been evaluated to be a collection of research to establish hypotheses and theory or, in other words, to explain second language acquisition in order to some day predict how it would occur (Ochsner, 1979).

One of the most interesting case histories in the second language acquisition literature, related to the role of input, deals with two young acquirers of English as a second language, one successful and one unsuccessful. Paul, the successful learner, was five years old when he was first studied by Huang (1970). According to Wagner-Gough (1975), Paul's progress was to be attributed to appropriate input. Ricardo, the less successful learner, was thirteen years old when he was studied by Butterworth (1972). Ricardo was required to participate in complex discussions, involving topics displaced in time and space and often using advance syntactical constructions. Paul's conversations, instead, were simple, fixed on topics of the here and now and contained a very limited amount of vocabulary. Wagner-Gough
suggested that it was this input difference rather than the age difference between the two boys which accounted for their differential success.

Input, referring to the speech directed to the listener, has also been referred to as simple codes as in child talk, motherese (Newport, 1976), and foreigner talk (Freed, 1978). Freed (1980) later compared speech adjustments made by adult speakers of English to both young children and foreign adults by using two independent studies (Newport, 1976; Freed, 1978). In the Newport (1976) study the native speakers were fifteen mothers in naturally occurring conversations with their children. The population for the foreigner talk study was eleven native speakers of English, again in naturally occurring conversation, with eleven foreign adults. These twenty-two adults were graduate or undergraduate students with some cultural variation, but, more or less, equivalent social backgrounds and similar student status. Within each study one-hundred utterances of speech to each group were compared to each other syntactically and functionally. Independent analyses of the motherese and foreigner talk yielded similar results when compared syntactically. The majority of utterances in both samples were well-formed, grammatically acceptable utterances containing at least one complete sentence in English. The proportion of stock expressions were equivalent. The only category which appeared proportionally
different was the use of fragments: twenty-seven percent to foreign listeners and seventeen percent to child listeners. The mean length in words of the average foreigner talk sentence was almost double that of the average sentence addressed to young children. However, the less proficient the foreign listener, the more like baby talk foreigner talk was syntactically. Analysis of speech adjustments to less proficient foreigners as compared with more proficient foreigners yielded significant differences on almost all measures of syntactic complexity (Freed, 1978). In terms of transformational complexity, baby talk was more deformed than foreigner talk. It characteristically had fewer sentences which were base structure form, more auxiliary movement, and a greater number of deletions. In the functional analyses, baby talk was interpreted as the directing of the child's behavior; while the primary functional intent of foreigner talk was exchange of information. In summary, an interacting set of perceptions including perceived cognitive ability, linguistic ability, and status appeared to account for some very sensitive differences (Freed, 1980).

Palmer (1978a) compared control and experimental EFL classes in Thailand, where the control class received 'traditional' instruction, including teacher talk in English, and the experimental class used 'language games,' a peer communication activity designed by Palmer and Kimball
The experimental group showed higher correlations between communicative and grammar-type tests, which might be considered a sign of language acquisition (Palmer, 1978b). Nevertheless, despite the greater emphasis on communication in the experimental class, Palmer found no significant differences between the groups on communicative measures. He suggested that this might have been due to the fact that the control group received more teacher talk in English. The experimental group had the games explained in the first language (Thai). He also noted that in the experimental classes almost all informal communication in English was eliminated from the classroom. In the 'Good Language Learner' study of Naimon, Frohlich, Stern, and Todesco (1978), their thirty-four good language learners reported a preference for second language classes in the immersion situation, rather than foreign language study at home. One essential difference between second language and foreign language classes is the presence of obligatory teacher talk in the target language in the former. Another is the possibility of interlanguage talk. Fathman (1976) studied young ESL students in Washington, D. C., and reported that the students in schools where there were more than forty non-native English speakers seemed to make more progress than those in schools where there were fewer foreign students. The motherese speech literature also reports that less mature children hear significantly more expansions as
well as repetitions from speakers (Cross, 1977). This may also be the case for teacher talk; Gaies (1977) affirms that this is the case, but presents no statistics.

It has been pointed out several times in recent years (Wilkins, 1976; Long, 1975) that classroom use of language is severely limited in terms of language use, in terms of communicative functions. An advantage of simple codes or informal input over standard classroom practice is the possibility of exposure to different discourse types and to different uses of language. According to Wilkins (1976), classroom language learning has concentrated much more on the use of language to report and describe than on doing things through language.

Researchers in second language learning have questioned whether acquirers who have had access to the simple codes of teacher talk, interlanguage talk and foreigner talk actually learn faster, and whether those who have not had access to these codes have had a harder time learning a second language (Krashen, 1980). Oiler (1980), Krashen (1980), and Larsen-Freeman (1983), all agree that the impact of these three types of input is an empirical issue and should be further investigated with a variety of approaches. Wilkins (1976) and Long (1975) contend that there is a need to determine how much communicative competence is successfully learned by second language performers who have had primarily simplified informal experience with the target language as
compared with those who have had primarily classroom experience.

Larsen-Freeman (1983) used these studies as a basis for the hypotheses that the use of prefabricated routines may aid a learner to acquire a second language. According to this study, using routines may eliminate the need for negotiation and allow the low-risk taker to engage a native speaker in a dialogue in which the learner has a great deal of control. The best situation where routines would be useful would probably be one in which the topic and language used were very predictable.

The influence of input on a second language learner has varied. As individuals, each learner has extracted that which has been useful to him. Based on Taylor's (1975) and Larsen-Freeman's (1978) evidence and logic, learners' reliance on particular strategies was not invariant, but changed according to the students' proficiency levels. In other words, all research related to the role of input suggested a direct relationship between achievement in second language and a student's proficiency level, but was not established statistically.

Studies Related to the Neurological Factor

A second perspective in the research of second language learning was the study of the neurological factor, specifically hemisphericity or cerebral dominance.
According to Rosenthal (1970), interest in hemisphericity grew out of the work of Sperry, who discovered that separating two hemispheres at the corpus callosum created two separate brains each possessing separate modes of functioning and processing incoming stimuli in different and often contradictory ways. The essential difference in brain function is that the left hemisphere contributes to a rapid understanding and retention of verbally-expressed ideas while the right hemisphere processes visual-spatial images (Gazzaniga, 1968). Research has further delineated two specific regions on the dominant hemisphere, usually the left hemisphere for right-handed individuals, specialized for language. They are Broca's area in the frontal lobe and Wernicke's area in the temporal lobe. Damage to the Broca's area results in a person's inability to produce smooth, well-articulated speech; although, the content and meaning are normal. Damage to Wernicke's area results in well-articulated speech almost totally devoid of content (Teyler, 1978). These observations, and others have led to the notion that Broca's area is primarily concerned with language production whereas Wernicke's area is primarily concerned with semantic aspects of language.

To further explain the major role of the left hemisphere in language, dichotic-listening research has been conducted. Dichotic-listening research done by members of the Haskins Laboratories has supported the hypothesis that
the left hemisphere is attuned to particular aspects of speech perception, namely the drastic restructuring needed to decode speech. In a number of experiments summarized in Liberman, Cooper, Shankweiler, Studdert-Kennedy, (1967), Haskin researchers have shown that there is a very indirect relationship between the acoustic speech signal and the linear succession of discrete speech segments we think we hear. They have hypothesized that the left hemisphere is specially equipped to deal with the decoding problem. They found that stop consonants such as /b/, /d/, /g/, /p/, /t/, and /k/ demand a great deal of restructuring. Vowels, on the other hand, require a minimum of decoding. The research has also shown that the perception of fricatives, consonants such as /s/, /z/, /f/, and /v/, was partially dependent on acoustic cues that require restructuring and partially dependent on cues that do not require extensive decoding. These results confirm the hypothesis that the left hemisphere contains a device designed especially for the perception of the speech code.

Evidence has been found that the grammatical structure of sentences as well as linguistic tone are analyzed best by the left hemisphere (Zurif and Sait, 1969). In some languages, like Thai, the pitch a word is spoken on may change the meaning of the word. For example, the Thai word /na'a/, spoken with a rising tone, means 'aunt', but the Thai word /nāa/, spoken with an even tone, means 'field.' Van
Lancker and Fromkin (1973) have found that Thai speakers show a right-ear advantage for dichotically presented syllables differing only in linguistic tone. This appears to be indicating that the left hemisphere may be specialized for linguistic processing, since tones presented to the same subjects in a nonlinguistic context did not give a right-ear advantage. This result has been consistent with studies that show no lateralization for nonlinguistic pitch perception (Doehling, 1972; Curry, 1968).

Blumstein and Cooper (1974) found a left-ear advantage in normal, right-handed subjects for the identification of intonation contours corresponding to the intonations used for declarative, imperative, conditional, and interrogative sentences in English, even when such contours were superimposed on linguistic material. This result contrasted with the result of Van Lancker and Fromkin's study (1973) which led to their conclusion that normal language perception may involve the simultaneous analysis of the linguistic input in both hemispheres.

Hartnett (1974) found that hemisphericity may play a role in adult second language learning. It was found that successful foreign language students who were taught by an analytic, heavily deductive method of learning Spanish, where explicit rules preceded practice, were predominately better in left-hemispheric skills. A group of students who were successful at a more direct, conversational, inductive
approach did not have a preference of hemisphere dominance. This suggested that the kind of learning that took place in the second group can be achieved through either hemisphere or a combination of both.

In recent years, the view of the left hemisphere has been altered by studies that reveal nonlanguage processing in the left hemisphere as well as studies that show some aspect of normal language processing in both hemispheres or in only the right hemisphere. Krashen (1973) concluded that the language function therefore may be overlaid on more primary mental abilities.

A number of recent studies of bilinguals have explored the lateralization patterns for their two languages. So far such studies have yielded contradictory results. Some point to greater left lateralization for first language than for second (Obler et al., 1975; Gaziel et al., 1977; Silverberg et al., 1979; Maitre, 1974). Other studies have found that lateralization patterns for first and second languages do not differ significantly (Barton et al., 1965; Carroll, 1978a; Walters and Zatorre, 1978; Galloway and Scarcella, 1979), and a few researchers report greater left lateralization for the second language (Rogers et al., 1977; Carroll, 1978b; Kotik, 1975). Most research in this area has been experimental. Two experimental techniques have been used: first, dichotic listening, in which a right-ear advantage is interpreted as indicating left hemisphere
processing, and second, tachistoscopic (visual) presentation in which a right visual field effect is interpreted as indicating left hemisphere processing.

The Schneiderman and Wesche (1983) study was conducted to determine the lateralization patterns of sixty-one adults with first language, English, and second language, French, and to determine how the proficiency in the second language would correlate with the degree of left lateralization in that language. The subjects' French proficiency was assessed by the French Proficiency Test of the Centre for Second Language Learning at the University of Ottawa. Subjects received subscores for listening and written comprehension, both of which correlated very highly with total scores \(r = .94, p < .001\) for listening comprehension and \(r = .98, p < .001\) for written comprehension). Subjects were also administered separate dichotic listening tests in English and French. The subjects' task was to repeat as many of the words in each set as they could remember.

The laterality coefficient proposed by Marshall et al. (1975) was computed for male and female subsamples and the total sample for both the English and French dichotic measures. The mean laterality coefficients for males suggested that they were somewhat more left-lateralized than females for both the English and French dichotic tests. Also, females appeared to be slightly more proficient in French than males. However, results of t-tests showed no
significant differences between males and females for any of the variables in this study.

Paired t-tests comparing the numbers of words correct in the right and left ears were computed to determine whether the degree of left lateralization was significant. This study indicated a significant right-ear advantage or left lateralization for the subjects on the English dichotic measure, but did not show a significant left lateralization advantage or right-ear advantage in their second language, French.

Pearson correlation coefficients were calculated between the variables of English and French laterality coefficients, the two French proficiency subscores, and familiarity with French words. The correlation matrix indicated that French listening comprehension was significantly correlated with French written comprehension \( (r = .85, p < .001) \). However, French listening comprehension correlated significantly with French laterality \( (r = .24, p < .05) \), while French written comprehension did not \( (r = .14, p > .05) \). This was modest support for the hypothesis that as proficiency increases the second language becomes increasingly left lateralized. The correlation analysis also yielded another interesting result: there was a substantial correlation between laterality in English and laterality in French \( (r = .62, p < .001) \).
In order to sort out the relationship between French laterality, English laterality, and French proficiency, a stepwise regression analysis was done with the French laterality coefficient as the dependent variable and the English laterality coefficient, French written comprehension, and French listening comprehension scores as independent or predictor variables. The results of the regression analysis indicated that English laterality was the only significant predictor of French laterality. Neither measure of French proficiency accounted for any significant amount of variation in French laterality when the effect of English laterality was partialed out. This suggests that as French proficiency increases, right hemisphere participation in that language does not change to any significant degree. No evidence was found to support the idea that individuals become increasingly left lateralized in their second language as their proficiency increases.

Hamers and Lambert (1977), in a pilot study of fifteen French-English bilinguals, reported no striking differences between first and second languages in visual field asymmetries, using a language identification task. Walters and Zatorre (1978), in another tachistoscopic study, found no evidence for differences in the lateralization of English and Spanish words for English native speakers enrolled in
advanced Spanish classes or for Spanish speaking students at Boston University.

In two studies, Barton, Goodglass and Shai (1965) and Kershner and Jeng (1972), the possibility of differential lateralization of first and second languages was not tested statistically, but impressionistically; the second language did not appear to be less lateralized than the first language. Subjects in the Barton et al. (1965) study were twenty Israeli students in the United States who were reported to be fluent in English. The investigators found significant right visual field effects for both English and Hebrew words. Although overall accuracy was greater in the native language (Hebrew), the difference between right visual field and left visual field mean recognition scores did not appear to be substantially greater than the difference between right visual field and left visual field mean scores in English (Hebrew: Right visual field mean = 5.65, Left visual field mean = 4.07; English: Right visual field mean = 4.85, Left visual field mean = 3.67; perfect score = 15). Similarly, Kershner and Jeng (1972) found a significant right visual field effect for both English and Chinese words in Taiwanese-born graduate students in the United States. The mean recall scores from the two visual fields appear very similar for both the first (Chinese) and the second (English) language (for Chinese, Right visual field mean = 15.22, Left visual field mean = 6.17; English
Right visual field mean = 15.35, Left visual field mean = 6.25. Maximum score = 24). In a dichotic listening study, Carroll (1978) reports that Spanish speakers appear to be more lateralized than English speakers studying Spanish at the University of New Mexico, both clearly lateralized to the left hemisphere or right ear advantaged.

Other experimental studies report, however, that the second language is less lateralized than the first language. Obler, Albert, and Gordon (1975), in a study of Hebrew-English bilinguals, found a right ear advantage for both Hebrew and English words, but a greater right ear advantage was observed in the first language. English-dominant Americans acquiring Hebrew in Israel displayed a greater right ear advantage for English words than for Hebrew words, and Hebrew-dominant Israelis who studied some English in school evidenced a greater right ear advantage for Hebrew words than for English words. Significance levels were not reported.

Results from a cross-sectional tachistoscopic study by Gaziel, Obler, Benton, and Albert (1977) suggested greater right hemisphere processing of second languages at the early stages of language acquisition, with decreasing right hemisphere participation with increased exposure to or acquisition of the second language. Subjects in this study were Israeli pupils studying English as a foreign language in the seventh, ninth, and eleventh grades. Most subjects
showed a right visual field advantage (left hemisphere dominance) for the native language, Hebrew, and this effect remained constant across age groups. Students in the seventh grade showed a left visual field advantage for English words, however, reflecting possible right hemisphere processing. Somewhat fewer students showed a left visual field advantage for English in the ninth grade, and most showed a right visual field advantage in the eleventh grade. Although right hemisphere pattern recognition ability in dealing with a different orthography cannot be ruled out as a contributing factor, the trend observed in these data is clearly consistent with Obler's (1975) stage hypothesis.

Speculation on the participation of the right hemisphere in language learning presents the question as to whether adult second language learners are able to reinvoke the right hemisphere processes that appear to be active during some stage of child language acquisition. In the Genesee et al. (1978) study, subjects who acquired their second language during adolescence appeared to rely more on right hemisphere strategies for a language-recognition task than either of the groups which had acquired the second language in early or in later childhood. Since all of Genesee et al.'s subjects were balanced bilinguals, proficiency was a constant. Thus the major difference between the groups of subjects in that study was their age of acquisition or recency of acquisition.
Carroll (1980) conducted a dichotic listening experiment with twenty-six adult Navajo-English bilinguals in order to extend the findings of Rogers, TenHouten, Kaplan, and Gardiner (1976). Rogers et al. (1976) study of Hopi-English bilingual children, fourth, fifth and sixth graders, found that the processing of Hopi involved greater right hemisphere participation. It was speculated that similar results might be obtained with Navajo-English bilinguals because of the vast conceptual differences of the two languages. Results obtained from the Navajo and English dichotic listening tapes were inconsistent as to a right or left hemisphere dominance based on language. Means across subjects indicated a right ear advantage for both Navajo and English words, but paired t-tests on the ear difference scores failed to reach significance. Results appear to suggest that bilinguals might be processing the two languages in a generally less lateralized mode. Looking at individual results, eight of the subjects demonstrated a right ear advantage for one language and a left ear advantage for the other. No measure of proficiency in the two languages was available; however, the majority of those subjects with a right hemisphere dominance for English were enrolled in an English tutorial program, and it was speculated that they were as yet in the process of acquiring English and had reinvoked right hemisphere mechanisms.
This possibility led to a controlled experiment with fifty-four adults enrolled in beginning, intermediate, and advanced Spanish classes with eighteen subjects at each level (Carroll, 1980). Results this time were quite consistent across all three groups. There was no significant right hemisphere processing of the language being learned, Spanish, at any of the three proficiency levels on the dichotic listening test. An analysis of variance yielded a significant main effect for language indicating that the second language was reliably more highly left hemisphere lateralized than the native language across all proficiency levels, $F(1, 51) = 11.60, p < .001$. They interpreted the results to mean that adult second language learners began processing the new language in a mode that was highly left hemisphere lateralized and continued to do so. They precluded the possibility of a reactivation of early childhood language acquisition processes, since right hemisphere participation was not invoked during any stage of learning. In summary, the degree of right hemisphere participation in the processing of second language stimuli may be a function not of proficiency, but rather of recency of acquisition.

For Carroll (1980) to determine the relationship of exposure age and setting on the mode of processing the second language, a second analysis of variance was computed with four groups differing in exposure age and setting. The
results indicated that those subjects with even limited exposure to Spanish in a home environment before age six had either a very low degree of left hemisphere lateralization or right hemisphere dominance for Spanish. However, subjects who were first exposed to Spanish in Latin America, presumably a naturalistic setting, after age eighteen showed the same high degree of lateralization as classroom learners.

To attempt to relate lateralization to performance, a measure of proficiency in the foreign language was calculated by subtracting the total words recalled in Spanish from the total words recalled in English. This yielded an English-Spanish recall difference score. Low English-Spanish recall difference scores indicated greater proficiency. The exposure group results suggested that early exposure, though minimal and with no productive use of the language, facilitates later learning. That is, the before age six group outperformed all groups except those with late exposure in Latin America.

Results from the current studies suggested that early exposure, even when it is minimal and there is little or no productive use of the second language, may be of importance to success and may produce a qualitatively different type of language learning even when later learning takes place in a formal classroom setting. Early exposure appears to
activate innate neurofunctional systems in such a way that learning at a much later period is facilitated.

Although as inconclusive and contradictory as these studies may appear, they establish a foundation for further research. Because of psychological factors and differences in learning situations, individuals vary in the time it takes to attain a given level of proficiency. Individuals also stabilize in their second language at different proficiency levels and for different reasons (Schneiderman and Wesche, 1983). It was concluded that more studies should concentrate on the variables influencing the individual in language learning.

Studies Related to Interlanguage Development

A third area of research in second language learning has been grouped into studies of interlanguage development. These studies were based on emergent second language morphology, syntax, and lexis. While focusing on interlanguage, the researchers took varying positions on the type of data considered and on the kinds of analysis they employed.

Brown (1983) raised several methodological issues concerning the 'morpheme studies,' particularly the problems of (1) generalizing across studies employing different data-gathering and/or data-analysis procedures, and (2) ignoring variation in the data in the hunt for similarities
in morpheme accuracy orders via the relatively weak Spearman rank order correlation statistic. He presented data from a new study, and through implicational scaling, found that clear patterns did exist within and across studies when bound and free noun phrase and verb phrase morphemes were distinguished, as suggested by Krashen (1977) and Anderson (1976) in previous studies.

In a study of difficulty ordering among more complex grammatical constructions, Ioup (1983) presented cross-sectional elicited data similar to Brown's. Ioup (1983) found no evidence of first language interference in the subjects' second language performance, and suggested that there was a natural difficulty ordering for the acquisition of these structures. The study recognized that cross-linguistic studies would be needed to substantiate claims to this effect.

Van Naerssen (1983) reviewed three sources of evidence on the order of appearance of the periphrastic and inflected future in Spanish. First language acquisition and historical linguistic data suggest the former to be the earlier form, and sociolinguistic studies show it to be the most frequent.

Another look at interlanguage was provided by Stauble and Schumann's (1983) description of verbal morphology in the basilang English of six native speakers of Spanish whose output was later compared with that of a seventh mesolang
speaker. Stauble (1978) indicated that the acquisition of English negation by Spanish speakers results in a continuum of developmental stages, each of which is closer to the target language than the one before it. The early stage of this continuum was called the basilang, and the intermediate and later stages were referred to as mesolang and acrolang. Based on the proportions of topic-comment and subject-predicate constructions found in the data, the investigators (Stauble and Schumann, 1983) concluded that the continuum might be productively explored as a progression of gradual syntacticization. This was supported in Givon's (1979) notion of a continuum of speech modes. Stauble and Schumann characterized the Spanish-English basilang with the following five descriptions: (1) negation consists of no + verb; (2) -ing is fairly frequent, between nine and sixty-five percent; (3) the correct use of the base form is also fairly frequent, but it is often overgeneralized to contexts requiring -ing, -s, past irregular, and -en; (4) is-cop is well established in appropriate contexts but is also overgeneralized to other copula contexts, resulting in elaboration of the copula system. Is-cop itself may not actually represent the acquisition of an English morpheme, but merely the transfer of a Spanish one; and (5) in general, the auxiliary system is undeveloped. This analysis clearly indicated that the speaker of the basilang exhibited very little morphology.
Kelley's (1983) paper reported on a study in progress of the interlanguage development of three native speakers of Spanish learning English. Citing previous work by Meisel et al. (1978) on German, Kelley addressed the issue of variation in linguistic performance across speakers characterized along one dimension as being in the same developmental stage.

Meisel et al. (1978) proposed a multidimensional continuum, in order to account for acculturation-influenced variable performance on the part of two of their subjects: two nine-year-old Italian girls learning German in Germany. While the linguistic development of both girls was essentially the same in most respects, one systematically deleted the copula in equational construction and the verb in NP + V + NP(NP) contexts, whereas the other subject performed almost perfectly in the same environments. Meisel et al. (1978) attributed this to the motivational orientations of the two girls.

Kelley (1983) reported on an in-progress study of three language learners at the same developmental stage as measured by negation. The intent of the study was to focus on the type and possible range of interlanguage variation within what had been described as a single developmental stage, and to show possible relationships between such variation and the acculturation profile of each subject. The three subjects were Ricardo, Carlos, and Felix whose
linguistic development was assumed to have stabilized.
Carlos and Felix came to the United States in their early twenties, and Ricardo when he was thirty-one; all had been here for at least nine years. Except for Ricardo, who had been in a literacy program for three months at the time of the interview, none of the men had the benefit of formal instruction in English. Answers to interview questions given by Carlos and Felix tended to be neutral with regard to comparative self-image and very integrative with regard to ethnic identity. Ricardo's responses, however, revealed his feelings of subordination to English speakers, and perceived his ethnic identity to be totally different from the English-speaking majority. Ricardo seemed to fall within the same developmental stage; yet, he differed greatly from the other two subjects when basilang as measured by negation was studied. Ricardo's speech appeared to be that of a verbally deprived neophyte when compared to the more syntactic speech of Carlos and Felix.

In another interlanguage development study Hansen (1983) investigated the acquisition and loss of Hindi-Urdu negation by English-speaking children. The subjects were two American children during periods of residence in India and Pakistan: three periods of exposure to Hindi-Urdu for a child who was eight at the completion of the study (Rebecca), two periods of exposure for a child who was five (Eric). Eric, after two weeks of target language exposure
fell back on an English-like word order (S-NEG-V-O) for the test. In the following three testing sessions the word order was adjusted (S-NEG-O-V). In Eric's spontaneous speech, by the fifth month of exposure his initial ordering strategy of English-speaking children had greatly decreased in frequency, and by the seventh month it was no longer used. Up until a year after leaving India, Rebecca applied an appropriate word order rule for negated utterances that were elicited in the testing situation. After that she reverted to the first language reflexification strategy which is characteristic of neophyte second language learners for the elicitation task. 'Forgetting' data from both children was interpreted as a recapitulation in reverse of the acquisitional sequence. The findings from this study suggested that not only the sequence of developmental stages in learner speech may be ascertained through careful 'forgetting' studies, but the prominence and duration of each stage as well. The data indicated, that in the course of language loss, learners go back in time to earlier strategies, including those showing first language influence. Hansen (1983) concluded that if there was first language transfer at some point in the learning of a language, the same 'interference' structure would reappear in the sequence of forgetting.

Hansen (1983) also collected cross-sectional data from twenty-five additional children on a one-time basis for
comparison to Rebecca and Eric. The effect of exposure time on the word order responses of negative utterances was more evident than age. In considering the data from the nine children who had been in the Hindi speech area the shortest time, less than three months, Hansen reported that six of them resorted to an (S-NEG-V-O) word order. Although this was a possible Hindi-Urdu order, it was obvious to the tester that the children were using a relexification strategy of plugging second language vocabulary into first language syntax. It was concluded from the cross-sectional study that children with slight exposure to a second language fall back on first language word order when presented a second language task which is beyond their competence, resulting in utterances which may not reflect their output in spontaneous speech. Second, the study found that by the second year of exposure most of the learners acquired the rule for correct preverbal negative particle placement in Hindi-Urdu and applied it appropriately when tested. Finally, it determined that prepredicate negator placement (S-NEG-O-V) was prevalent in the testing situation as it was in the spontaneous speech of English-speaking learners of Hindi-Urdu.

The study of Lightbrown, Spada, and Wallace (1980) was carried out within the context of a larger longitudinal study of the ESL development of approximately 175 French-speaking students studying English in French language
public schools near Montreal (Lightbrown and Barkman, 1978). The subjects of the (1980) study were French-speaking children and adolescents who were learning English primarily through classroom exposure to the language. The subjects were at three grade levels, sixth, eighth, and tenth and had received from two to six years of classroom instruction in English. The schools in which the observations were made had a system of 'streaming' students according to academic ability. In this study, however, the only difference across groups at the same grade level was at grade ten, where the class referred to as 10A was considerably more advanced than the class referred to as 10B. The data analyzed in this study were obtained by means of two instruments designed especially for this study: (1) a grammaticality judgment task requiring students to identify and correct incorrect uses of the structures under investigation and (2) a communication game requiring students to describe some pictures. The results of the study concluded that there were patterns of consistency in second language acquisition, but the cross-sectional 'obligatory contexts' methodology failed to capture important aspects of the development of learners' control of particular linguistic structures. Other studies concluding the same had been conducted earlier by Anderson (1977), Hakuta (1974) and Hatch (1978). Lightbrown et al. (1980) summarized that even ninety percent correct supplying of a form in obligatory contexts can not
be taken alone as sufficient evidence that the learner knows the functions of the form or the restrictions on its uses. That is, incorrect utterances as well as correct ones might be generated by the same rules. For example, in this study, many students appeared to use the copula -s, -ing, and in many cases, the auxiliary almost without error. However, evidence from outside the obligatory contexts showed that they also overextended these forms, using them where they did not belong. Based on the cross-sectional analysis, it appeared that there was a tendency for both correct and incorrect uses of these forms to decrease for a period, as students discovered their functions. The forms then reappeared, used contrastively and without overextension.

In recent years there has also been considerable discussion regarding the merits of contrastive analysis (CA) hypothesis. Two versions of the hypothesis have emerged: (1) the predictive version and (2) the explanatory version. The first version claimed that all errors in second language learning could be attributed to patterns of the native language. From this it followed that if two languages in question were similar, the burden of learning was reduced, whereas if great differences existed, one had more to learn and could therefore speak of interference areas or negative transfer. As Lado (1957) claims: individuals tend to transfer the forms and meanings, and the distribution of forms and meanings of their native language and culture to
the foreign language and culture. The second version which claimed that errors should be examined and then explained as to why the error occurred. Empirical studies have failed to substantiate interference as the sole or even primary source of errors in second language learning. It has even been shown that there are many cases of errors which cannot be attributed to a learner’s native language (Buteau, 1970; Duskova, 1969; Nemser, 1971; Richards, 1974).

As an alternative, researchers have begun to investigate intralingual complexities as a source of errors. Underlying this approach was the notion of similarity between first language and second language acquisition (Ervin-Tripp, 1974; Cook, 1973; Schachter, 1974; Ioup and Kruse, 1977). Gass's (1980) research dealt with the acquisition of English relative clauses by seventeen adult speakers of typologically diverse language backgrounds. The native languages of the subjects were Arabic, Chinese, French, Italian, Japanese, Korean, Persian, Portuguese, and Thai. All were enrolled in an English language training program at Indiana University. The results of the study suggested that three factors played a role in determining the learning patterns of a second language learner: (1) universal factors, (2) specific facts about the learner's native language, and (3) specific facts about the target language. In considering the relationship between these factors, this study indicated that it was universal
principles of language which played the leading role since they were dominant in assigning a relative order of difficulty to certain structures. The strongest hypothesis consistent with these facts is the following: Universal factors determine the general outline of learning. Language-specific considerations of either the native or the target language can come into play only whenever universal factors underdetermine the result. Gass (1978, 1980) concluded that a multifactor approach was required to understand the complete interrelationship of factors and to determine the dominant factors.

Zobl (1983) proposed a revised view of the role of contrastive analysis in interlanguage studies. He believed that such analyses needed to be constrained by principles governing language contact, historical change and language acquisition. Zobl invoked evidence from Schachter (1974) and Butterworth (1972) to account for data on English and French for and for to constructions, and on resumptive pronouns in the English relative clauses of Arabic and Farsi speakers. The preposition for and a combination of for to occur as infinitive markers in the speech of French-speaking children learning English naturalistically as well as in the speech of adult ESL learners. Both substitutes of poclitic to are attested also in the English speech of Spanish-speaking learners (Butterworth, 1972). Schachter (1974) was one of the first to attend to the incidence of
resumptive pronouns in relative clauses produced by Arabic and Persian ESL learners, whose first languages make use of this structural device, as compared with Chinese and Japanese learners. She found that Chinese and Japanese students in an English composition task committed significantly fewer errors in using English relative clauses than did Persian and Arab students. But Schachter also pointed out that the number of relative clauses actually produced by Chinese and Japanese students was much lower than the other two groups. She attributed this finding to native language interferences, a fact predicted by contrastive analysis.

In the field of second language acquisition relative clauses have usually been studied not to discover the sequence in which they are acquired but rather to speak to more general hypotheses of interest to the field. For example, Bertkau (1974) used learner's relative clauses to study the process of simplification. Schachter (1974) and Schachter, Tyson, and Diffley (1976) examined relative clauses to determine the extent of native language transfer in the learner's interlanguage. Gass (1980) studied relative clauses for the same purpose and Chiang (1978) used relative clauses to show the relationship between relative clause frequency and factors such as proficiency and first language. Ioup and Kruse (1977) were also interested in the relative clauses from the point of view of native language
transfer, but unlike the other researchers they explored the sequence of acquisition of these structures. They attempted to determine whether there was a natural difficulty ordering among four types of relative clauses. In the first type (SS), the head noun was the subject of the main clause and the relative pronoun was the subject of the relative clause. In the second type (SO), the head noun was the subject of the main clause and the relative pronoun was the object of the relative clause. This type allowed the relative pronoun to be optionally deleted. In the third type (OS), the head noun was the object of the main clause and the relative pronoun was the subject of the relative clause. In the fourth type (OO), the head noun was the object of the main clause and the relative pronoun was the object of the relative clause. The relative pronoun could also be optionally deleted in this sentence. Ioup and Kruse (1977) found three conflicting hypotheses in the literature with regard to the ease of production and comprehension of relative clauses. Kuno (1975) argued that center embedding was perceptually difficult and therefore OS and OO types should be easier than SS and SO. Kennan (1975) hypothesized that relativized subjects were more accessible than relativized objects, and SS and OS types should therefore be easier than SO and OO types. Sheldon (1974) proposed the parallel function hypothesis, which maintains that relative clauses which are easiest to acquire are those in which the
relative pronoun has the same function as the head noun. Thus, SS and OO types should be easier than SO and OS sentence types. Ioup and Kruse's (1977) data supported only Kuno's (1975) hypothesis. Kennan's hypothesis was not supported, and the results for Sheldon's hypothesis were the opposite of what was predicted.

Schumann (1980) analyzed the relative clauses in the production data of five subjects studied by Cancino, Rosansky, and Schumann (1978), one subject examined by Agnello (1977) and another subject investigated by Bruzzese (1978). The data concerning each subject's use of relative clauses were reviewed and compared. Jorge was a thirteen-year-old Colombian boy who lived outside Cambridge, Massachusetts, and attended an all-English school where he had only minimal instruction in ESL. Jorge produced mostly OS and OO sentence types and few SO and SS types. Jorge almost always supplied a relative pronoun where required and supplied it over sixty percent of the time where it was optional. Juan, Jorge's ten-year-old brother, had essentially the same kind of exposure to English as Jorge, and he also produced many more OS and OO sentence types than SO and SS. Juan almost always supplied a relative pronoun where required, ninety-eight percent of the time, and did so almost eighty percent of the time where it was optional. Marta was a five-year-old girl from Puerto Rico. She attended an all-English nursery school in Cambridge,
Massachusetts, where she received no instruction in English. Much more frequent were 00 and OS sentence types in Marta's speech than were SO and SS. She supplied relative pronouns where required, eighty percent of the time, and supplied them in optional contexts only twenty-one percent of the time. Cheo was a five-year-old Colombian boy who attended an all English kindergarten in Boston and who also received no special instruction in English as a second language. The 00 and OS sentence types were much more frequent in his speech than were SO and SS types. He supplied relative pronouns forty-five percent of the time where required and twelve percent of the time where optional. The next three subjects differed from the former in that they were all considered to be pidginized by their researchers. That is, their interlanguages appear to have stabilized at a very early stage. Alberto was a thirty-three-year-old Costa Rican who worked in a frame manufacturing factory. He had studied some English in high school in Costa Rica, but received no English as a second language instruction while in the United States. Alberto essentially used only OS relative clause types and except for three instances, using who in one case and the Spanish que in the other two, he supplied no relative pronoun at all. Angela was an Italian woman of seventy-eight who had lived in the United States since she was thirty-seven. She had received no instruction in English until her seventy-eighth year, when she attended
an adult ESL class taught by her granddaughter. Angela used few relative clauses in general and that 00 and OS sentence types, as a group, were more frequent than SO and SS types. Like Alberto, she did not supply relative pronouns. The last subject was Guiseppe, Angela's eighty-four-year-old husband. His exposure to English was similar to Angela's except that he never received any instruction. However, through work contacts, his exposure to English in the natural setting was probably greater than hers. The OS and 00 sentence types were more frequent than SO and SS types. Guiseppe was more likely to supply relative pronouns, especially in required contexts, than were Angela and Alberto. Based on the data from these subjects, Schumann (1980) concluded that while learners are in the pidginized stage of second language acquisition, the no + V stage of negation, they will tend to produce very few relative clauses; a stabilized subject at this stage will tend to produce relative clauses without relative pronouns; and that the most pidginized speakers had no relativization at all. In summary, Schumann was in accord with Kuno's (1975) hypothesis and Ioup and Kruse's (1977) research results, 00 and OS sentence types were preferred to SS and SO types. The study (Schumann, 1980) claimed at least some tentative evidence that relative clauses may develop in a sequence characterized by zero relativizer, pronominal relativizer, and finally the
relative pronoun. This sequence was also found by Bickerton and Odo (1976) in Hawaiian Pidgin English.

Studies Related to Individual Variables

A final perspective in second language research has been focused on the individual learner and the various socio-affective variables related to the individual. A few variables studied in relationship to second language learning have included achievement, age, proficiency level, self-esteem, setting, and sex. Cognitive learning style and ethnic origin in relationship to second language learning were variables less evident in previous research.

One particular Spanish immersion program was studied as a pilot group for nine successive years. One variable studied was achievement in native language (English) skills. Jashni's (1975) study confirmed that there was no retardation of English language skills and subject matter achievement, and that the students were performing comparably in content areas with students following a traditional curriculum.

A second variable considered with this immersion group was second language proficiency which was charted at each grade through various tests of reading, grammar, and vocabulary. Fluency and communicative competence studies (Boyd, 1974; Weissman, 1978; Galvan and Campbell, 1979; Plann, 1976) have concluded that incorrect input and peer
group pressure may have contributed to a stabilization of the students' Spanish.

Other areas of focus with this group included attitude research (Snow, 1979), opportunities to speak Spanish (Snow, 1979) and language retention (Cohen, 1974). Cohen (1974) detected noticeable differences in the students' speech after the three-month summer layoff. He found shorter length sentences, more frequent errors, and more confusion between 'ser' and 'estar.' Cohen also found examples of the 'last learned-first forgotten' pattern.

Snow, Galvan and Campbell's (1983) follow-up study of this population included interviews with ten of the Spanish immersion students after they had left the program to enter into junior high school. In general, the students' Spanish had not declined or improved measurably during this year; although, their exposure to Spanish in junior high school had been more limited. Vocabulary test scores revealed that the Anglo students scored higher on the average in 1979 than the native Spanish speakers. It was suspected that the test instrument itself might have been biased. In conclusion, it was summarized that this study gave added weight to the argument that schooling in a second language does not have a detrimental effect on the students' first language development.

A fairly large number of studies has been published in which age differences in speed or ease of second language
acquisition were assessed. These studies have been reviewed by Krashen, Long, and Scarcella (1979). Snow (1983) reviewed a previous study (Snow and Hoefnagel-Hohle, 1978) which used an extensive test battery in an attempt to isolate as many components as possible of second language ability. Fifty-two native English-speaking subjects ranging in age from three-years to fifty-five-years were studied. All subjects had moved to the Netherlands for periods of at least one year, and were acquiring Dutch without a significant amount of formal instruction. After arrival in the Netherlands, the subjects were first tested within six weeks of their first exposure to Dutch; they were tested a second time, four to five months after first exposure, and they were finally tested nine to ten months after first exposure. In addition, English speakers who had been living in the Netherlands for at least two years were tested once, to provide some indication of an ultimate level of achievement of the second language learners in the various age groups.

The results of the study were quite clear. Performance on the tests improved with age, at least through the teenage years. The adults were slightly worse than the teenagers, but better than the younger subjects at first testing. Adults improved relatively slow between the first and the final test, though their acquisition prior to the first test had been quite fast. The teenager had learned so much Dutch
prior to test one, that they had achieved almost nativelike proficiency and could learn very little more during the next year. The younger learners acquired Dutch much more slowly, though by the third test they were approaching the scores of the teenagers on most tests. Older learners had an advantage on aspects of second language skill that depended strongly on rule acquisition: tests of syntax; morphology and metalinguistic ability; and on vocabulary. Tests of communicative skill showed smaller and less persistent age differences. Pronunciation showed the least effect in the relationship to age, with the older learner performing better only at the first test session.

The results of this study indicated that older was better for second language learners. Results of other studies (Snow and Hoefnagel-Hohle, 1979; Ervin-Tripp, 1974; Ekstrand, 1976; Fathman, 1975; Asher and Garcia, 1969; Snow, 1980) supported the finding that older learners are better in syntax and morphology than younger ones. Results pertaining to the acquisition of second language pronunciation or phonology were more varied. Some reported that younger learners were better in pronunciation (Fathman, 1975; Oyama, 1976; Ekstrand, 1977), whereas others reported that older learners performed better in phonology and listening skills (Snow and Hoefnagel-Hohle, 1978). Cummins (1979) suggested that older learners may acquire 'cognitive/academic' second language skills more rapidly
than younger learners because of their more advanced cognitive development.

Macaulay (1980a) added that it was not necessarily age that caused a difference in utterances, but the ability of the subjects' muscles. It was explained that since about one hundred muscles were involved in the production of speech sounds and since speech at normal conversational speed required about fourteen instructions per second to each muscle involved it could be seen that any activity that required up to fourteen hundred different movements per second would be very complex indeed. It was proposed that it was this complexity that made it very difficult for adults to learn how to speak another language without a foreign (native) accent. Fortunately, young children, according to Macaulay, were very talented in this respect, so that they learned the necessary movements very successfully, at least once they had reached the age where they could control the movement of the lips and tongue with great precision.

In summary, it appears that children learn foreign language more slowly than adults, yet the earlier one starts to learn a foreign language the better one will speak it (Oyama, 1976; Seliger, Krashen, and Ladefoged, 1975). Snow (1983) revealed that studies showing child learners superior to adult learners have always tested for second language ability after at least five years of first exposure to the
second language. It was further explained that studies showing older learners better than younger ones have always tested within the first two years of learning. Therefore, there are two aspects of second language acquisition when considering age differences, the speed of acquisition and the level of achievement. Child second language learners excel in an ultimate level of achievement, but adult second language learners excel in speed of acquisition. McLaughlin (1977) believed there was still no conclusive evidence that there was a sensitive period of language learning or that there were definite child-adult differences in language learning.

There also appears to be some controversy in research results reporting the effect of setting or environment on second language learning. Some studies suggested that informal settings were most effective in increasing second language proficiency (Upshur, 1968; Mason, 1971); while other studies suggested that formal language instruction has been of more benefit, at least to adults (Krashen and Seliger, 1976; Krashen, Jones, Zelinski and Usprich, 1978). Krashen (1976) has suggested that formal and informal settings may contribute to different aspects of second language competency and that differences may exist between children and adult learners in how well they 'acquire' or how much they 'learn' in different settings. The controversy has not yet been settled.
Although knowledge of how a person learns a second language is incomplete, researchers know that a variety of linguistic and psycholinguistic factors interact to affect the acquisition, the use, and the output of a second language. The purpose of Parson's (1980) study was to investigate the relationship between the oral production of Americans enrolled in a beginning-level French course and their scores on several self-esteem measures. The basic linguistic premise was that a student's errors in second language production were an indication of one's abilities to use a second language. Fitts (1972), using the Tennessee Self Concept Scales (TSCS), showed that self-esteem correlated with the prediction of future performance, with academic performance, and with motivation and attitudes. He defined self-esteem as the sum of one's attitudes toward oneself, the evaluation of what a person feels he is. Of the initial one-hundred and eighty-one cases of data, only fifty-four contained complete sets of information. Correlations were based upon all available cases of data for a given correlation. No significant correlation was found to exist between speaking scores and age, sex, school, the number of foreign languages studied, the number of years of French, when the learner began French, and/or the skill emphasized in the study. But, it was evident that the relationship between self-esteem and speech scores suggested that self-esteem had interacted with second language input.
to affect the learner's acquisition of that language. In addition, Parsons (1980) found that the teacher appeared to have an important influence both on the esteem of the students at the task and specific level and on their oral performance.

A review of literature by Mrosla (1983) indicated that teacher variables may affect student learning outcomes (Blackman and Goldstein, 1982; Brophy, 1973; Ebmeire and Good, 1979; Kirschenbaum, 1969; McClellan, 1971; McLeod and Adams, 1981). Research has shown that some teachers change from year to year. It has been suggested that these teachers' subtle context variables or personal circumstances may monitor the amount of student learning that is produced.

Beebe (1980) studied further the relationship of the teacher/listener on the second language speaker. Twenty Spanish-English bilingual Puerto Rican third graders were given four separate interviews with different ethnic origin listeners, each consisting of a casual conversation and some ESL exercises. Garcia and Zimmerman (1972) claimed in a study of Mexican-American first graders, that an examiner of Mexican-American ethnicity had a significantly greater motivating value than an examiner of Anglo origin. Their article described frequency of a nonlinguistic response which was different from Beebe's study which describes accuracy of a linguistic response and particularly strategies used when encoding it. Results of Beebe's study
were contradictory to Garcia and Zimmerman's findings. Syntactic complexity and risk-taking were found to be significantly higher with the monolingual Anglo interviewer, not the Hispanic interviewer (Beebe, 1980). Giles and Powesland (1975) explained this phenomenon as response matching. According to these researchers, the bilingual children realized that more complex syntactic structures were generally used by the native speaker of English than by the Spanish-dominant interviewer. The children's responses matched by producing more complex structures with the native speaker/receiver and less complex structures with the Hispanic speaker/receiver. Most of these research projects were speculative in nature.

Macauley (1980a) discredited much research based only on listener responses to recorded speech samples. He argued that listeners made inaccurate judgments, reflecting the prejudices and stereotypes that exist in a community or within the listener. He claimed that listener judgments were also likely to vary with the age, sex, education, race, and social background of the listener. One investigation which Macaulay (1980b) used as a basis for this premise asked a group of student teachers to evaluate the speech of some Anglo American, Black American, and Mexican-American children. The student teachers viewed a videotape and heard an accompanying audiotape. The teachers did not know that excerpts from the same speech sample were played with the
videotapes of the three different groups of children. Although the speech for each group was the same, the student teachers rated the speech of the Black American and Mexican American children as less standard than that of the Anglo American children. Macnamara (1973) concluded that the attitude of the teacher toward language in the classroom was particularly significant.

The available evidence of differences between boys and girls in language development has been based on a narrow range of measures, but has been suggestive for further research (Dale, 1976). That females are superior in verbal processing has been a widely held generalization among both laymen and psychologists. Although the understanding of language development has increased greatly in the past twenty years, few studies of sex differences in language development have been conducted. Sex differences were discussed earlier in the chapter in relationship to lateralization patterns (Schneiderman and Wesche, 1983). A comprehensive review of sex differences in all aspects of psychological development has been provided by Maccoby and Jacklin (1974). The limited amount of data available on language suggested that the advantage of females may be smaller than believed or even nonexistent. Maccoby and Jacklin proposed three distinct phases in the development of sex differences. Before the age of three-years girls may be in advance of boys, though this is based on very old studies
of the 1920s and 1930s. Studies of preschoolers do not typically show differences. By age three-years boys have caught up, and few differences are observed until adolescence. If differences are revealed, they usually favor the girls. This pattern of superior verbal performance was usually based on tests of verbal skills, such as spelling, punctuation, comprehension of complex written texts, comprehension of logical relations expressed in verbal terms, and some measures of verbal creativity. These tests showed a consistent, though modest, difference of about one quarter of a standard deviation in favor of girls (Maccoby and Jacklin, 1974; Dale, 1976).

In relationship to field-dependence, Bergum and Bergum (1980) contended that there was no sex differences; although, Witkin's research has claimed that males were consistently more field-independent than females (Witkin and Oltman, 1967). Other researchers contended that the difference in field-dependence appears earliest at age eight-years and expands until late adolescence (Fiebert, 1967; Witkin, Goodenough, and Karp, 1967). Fairweather (1976) reported that cross-cultural studies have noted that sex differences on certain spatial tests appear only in highly stratified cultures in which males exercise strong authoritarian control over females; less structured societies showed little differences.
The research of cognitive learning styles of students studying English as a foreign language was quite limited. Leino's (1980) study showed the educational relevance of both the Paragraph Completion Method (PCM), an instrument developed by Hunt et al. (1978) in the measurement of students' conceptual level, and the Group Embedded Figures Test (GEFT) in the Finnish setting. Results of the GEFT revealed that field-dependence was related to school achievement with the exception of foreign language (English), with which the correlation was not significant. Other studies reviewed by Leino did reveal significant correlations between foreign language studies and field-dependence. These studies included Hosenfeld, 1975; Zampogna, 1976; Grippin et al., 1977; Grieve et al., 1971; and Naimon et al., 1979 which were discussed previously in Chapter I of this study.

The possible relevance of cognitive learning style to second language learning was suggested in the early 1970s (Brown, 1973). Since then a number of scholars have investigated field-dependence as a cognitive disembedding ability which might affect the second language performance of secondary school students studying French as a second language in Canada (Tucker et al., 1976; Bialystok and Frohlich, 1977, 1978; Naimon et al. 1978). These studies were reviewed by Hansen and Stansfield (1980) and previously discussed in Chapter I of this study. The study of Hansen
and Stansfield (1980) was designed to collect more evidence on the relationship between student's field-dependence or field-independence and subsequent achievement in a formal language class. Palmer (1979) pointed out that second language proficiency ultimately involves not only skill in linguistic analysis and restructuring, but also competence in authentic social communication. For this reason, Hansen and Stansfield (1982) felt that the cognitive and social/psychological traits characterizing either style preference seemed implicated in the development of an integrated language proficiency. They believed the style factor might influence second language learning in different ways depending on the context and the particular language skills. Brown (1978) proposed that field-independence might be beneficial in the formal instructional situation whereas field-dependence may augment second language development in the informal situation.

Hansen and Stansfield's (1980) study examined a formal, introductory foreign language class where three-hundred college students were learning both linguistic and communicative competence in the target language of Spanish. The principal question concerned the general relationship between the students' degree of field-dependence and their performances on measures of linguistic, communicative, and integrative competence in the second language. Secondarily, the study addressed the influence of student sex and
scholastic ability in conjunction with cognitive style as factors in second language achievement.

A correlational research design was used to address the issues pertinent to this study. The independent variable was student field-dependence or field-independence, assessed by performance on the GEFT. The moderating factors of student sex and scholastic ability were included for their possible influence on Spanish achievement. Spanish language proficiency was the dependent variable, separated into three components of language ability: linguistic, communicative, and integrative. Linguistic competence was measured by students' performance on written discrete-point examinations of Spanish grammatical knowledge including the Final Exam. Communicative competence was assessed by two measures: Oral Grade Average and Oral Skill Evaluation. Tasks included such activities as interviews, quiz games, role-playing, question-answer periods, and free discussion. Integrative competence was determined by course grade and a Cloze Test of multiple-choice words. GEFT scores were obtained for 253 of the 293 students completing the course. Initially, Hoyt reliability estimates were obtained for the GEFT (.90), the Final Exam (.97), and the Cloze Test (.75). The Pearson product moment correlational procedures were then used to determine the direction and strength of the relationship between student field-dependence and performance on the measures of Spanish proficiency. Where possible the
observed correlations were corrected for attenuation to reduce measurement error (Nunnally, 1978). All the correlations proved to be positive and significant at the .05 level. The positive trend of the correlations indicates that among these students a greater degree of field independence, as opposed to field dependence, was associated with a higher level of achievement on all the measures of Spanish proficiency. The strength of these relationships varied. For example, the strongest (disattenuated) relationship \( r = .43 \) was found between field independence and scores on the Cloze Test. The Final Exam correlated at \( r = .28 \). The lowest correlations were found between students' cognitive learning style and Final Course Grade \( r = .21 \) and Oral Skill Evaluation \( r = .21 \). In addition to the major correlations, another set of correlational information was produced to assess the relationship between cognitive learning style and the two moderator variables, student sex and student scholastic ability. The latter was indicated by A.C.T Math and A.C.T. English scores for a subgroup of 102 students. There was a correlation of \( r = -.1 \) between field-depence and student sex, which was low and not significant at the .05 level. The negative nature of this coefficient indicated that a slightly higher degree of field independence was associated with the male versus the female group in this sample. On the other hand, the correlations between student sex and foreign language
proficiency were all positive and significant, ranging from \( r = .11 \) to \( r = .28 \) and showing that females were performing consistently at a higher level. Field dependence and A.C.T. English correlation was .32 whereas with the correlation with A.C.T. Math was .48. The correlations between the academic achievement scores and student performance on the language proficiency measures ranged from .16 (A.C.T. Math and Oral Evaluation) to .46 (A.C.T. Math and Cloze Test). Partial correlation techniques were then used to assess the data further. When student sex was partialled out of the correlations, correlations between student cognitive learning style and level of Spanish proficiency was raised slightly. At the removal of scholastic ability, there remained only a significant relationship between field dependence/field independence and performance on the Cloze Test (\( r = .22 \)). The results of the study indicated that field independence or cognitive restructuring ability, is an individual learner trait that plays a positive, although minor, role in the development of overall foreign language proficiency. The positive, linear correlations ranging from .20 to .43 between student cognitive style and performance on the various measures of Spanish competence suggest that a relatively greater degree of field independence is associated with a high level of achievement.
Research in second language learning has increased in the last two decades within a wide range of the interrelated fields of anthropology, education, ethnography, linguistics, psychology and sociology (Castaneda, 1977; Decker, 1983; Dulay, 1974; Halverson, 1979; Jarvis, 1983; Kerlinger, 1973; Hunt, 1979; Leino, 1980; Lepke, 1977; Morris, 1978; Ramirez et al., 1974; Satterly, 1979; Stevick, 1976; Witkin et al., 1977) but has not, by any means, resolved the numerous questions man has asked about it. Previous studies described herein have resulted in contradictory findings often explained by differing research methodology, sample sizes, and length of time related to the studies. The studies have not claimed to possess proven answers for second language acquisition, nor have they determined one perfect method of teaching a second language, but they have added to the knowledge of second language learning to a state of theoretical progress on which further research could be based. Second language learning based on the previously reviewed literature is a field of study encompassing numerous, interrelated variables, each playing a different role in the acquisition of a foreign language.
CHAPTER BIBLIOGRAPHY


Anderson, R. W. The impoverished state of cross-sectional morpheme acquisition/accuracy methodology (or: The leftovers are more nourishing than the main course). Working Papers on Bilingualism, 1976, 4, 47-82.


Bergum, J. E., and Bergum, B. O. Field dependence, perceptual instability, and sex differences. Paper presented at the Annual Convention of the Southeastern Psychological Association, Oklahoma City, Oklahoma, April 10-12, 1980.


Blumstein, S. and Cooper, W. Hemispheric processing of intonation contours. Cortex, 1974, 10, 146-158.


Cummins, J. Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. Working Papers on Bilingualism, 1979, 19, 198-205.


Ervin-Tripp, S. Is second language learning like the first?  
*TESOL Quarterly*, 1974, 8, 111-127.

Fathman, A. The relationship between age and second 
language learning productive ability.  *Language 

Fathman, A. Variables affecting the successful learning of 
English as a second language.  *TESOL Quarterly*, 1976, 
10, 433-441.

Fairweather, H. Sex differences in cognition.  *Cognition*, 

Fiebert, M. Sex differences in cognitive style.  *Perceptual 

Fitts, W. H. The self-concept and performance.  Nashville, 
Tennessee: Dede Wallace Center, 1972.

Freed, B. Talking to children, talking to foreigners.  
Paper presented at the Los Angeles Second Language 
Research Forum, University of Southern California, 

Freed, B. Talking to foreigners versus talking to children: 
Similarities and differences. In Scarcella, R. and 
Krashen, S (eds.), Research in second language 
acquisition, Rowley, New Jersey: Newbury House 

Gaies, S. The nature of linguistic input in formal language 
learning: Linguistic and communicative strategies in 
ESL teachers' classroom language. In Brown, H. D., 
Yorio, C. and Crymes, R. (eds.), Teaching and learning 
English as a second language: Trends in research and 
practice. On TESOL '77. Washington, D. C.: TESOL, 
1977, 204-212.

Galloway, L. and Scarcella, R. Cerebral organization in 
second language acquisition. Paper presented at the 
winter meeting of the Linguistics Society of America. 

Galvan, J. L. and Campbell, R. N. An examination of the 
communication strategies of two children in the Culver 
City Spanish Immersion Program. In Anderson, R. W. 
(ed.), The acquisition and use of Spanish and English 
as first and second languages. Washington, D. C.: 
Teachers of English to speakers of other languages, 
1979.


Hansen, J., and Stansfield, C. Field-dependence and field-independence as a variable in second language cloze test performance. A paper presented at the International Conference of Teachers of English to Speakers of Other Languages (16th, Honolulu, Hawaii, May 1, 1982).


Hartnett, D. The relation of cognitive style and hemispheric preference to deductive and inductive second language learning. Paper presented at the Neurosciences meeting, Brain Research Institute, UCLA, September 27, 1974.


Mason, C. *The relevance of intensive training in English as a foreign language for university students.* Language Learning, 1971, 21, 197-204.


Mrosla, J. *Differences between field-dependent and field-independent cognitive styles of low and high achieving mathematics students.* An unpublished dissertation at North Texas State University, Denton, Texas, August, 1983.


CHAPTER III

METHODS AND PROCEDURES OF THE STUDY

Description of the Population

The subjects involved in this study were sixty-eight junior high and high school students enrolled in an ESL class within an average metropolitan independent school district. The school district encompasses a metropolitan area in northeast Texas between two larger school districts east and west of it. It is bordered on the north and south by districts of equal size. The student population in the district is comprised of lower-, middle-, and upper-class families. The students in the ESL program and in this study were also from all three income levels.

The four ethnolinguistic groups selected for the study were Laotian, Spanish, Tongan and Vietnamese since they cummulatively comprised approximately seventy percent of the entire secondary ESL classes in the aforementioned district. Although seventy-seven students were administered the Group Embedded Figures Test, nine students were eliminated from the study since they were not of the selected cultures. Other language groups were represented by three or less individuals; therefore, they were not considered
representative of a sample group. Specific numbers were listed in Chapter I of this study.

The students from the four selected cultures consisted of twenty-five Laotians, thirteen Spanish, thirteen Tongan, and seventeen Vietnamese composed of forty-three males and twenty-five females. Students were distributed through grades seven to twelve as follows: eight seventh graders, ten eighth graders, sixteen ninth graders, sixteen tenth graders, twelve eleventh graders, and six twelfth graders. The subjects were identified as twelve NEP, fifty-four LEP, and two FEP level students.

Students enrolled in the ESL classes from these four ethnolinguistic groups were selected for this study since each group was represented by thirteen or more students. There has also been little research conducted with the Laotian, Tongan and Vietnamese culture groups. The population of many ESL programs since the Vietnamese war ended in 1975 has consisted of refugees from Vietnam and surrounding countries, Laos and Thailand. This accounts for approximately sixty-two percent of the population in the ESL classes in this study. Other students enrolled in ESL classes were enrolled in this district within the past two years due to job changes for parents with large corporations, parents in the military, immigration from Mexico and other countries, parents who became divorced or remarried, and students with an exchange program. All ESL
students were mainstreamed into all English-speaking academic/subject related classes. The ESL class was either in lieu of a regular academic English class or in addition to a regular academic English class. All students of each culture were from a single geographic location except for the Spanish-speaking students. The Spanish group consisted of nine students from Puerto Rico, three students from Mexico and one student from Argentina.

Procedures for Conducting the Study

The most recent reading percentile score and language percentile score of the CAT were taken from each student's permanent record. Since this information was required for entrance into the ESL program, all data were available for the seventy-one students identified in the four selected ethnolinguistic groups. Each of the two scores, reading and language, from the CAT was considered as a separate score of achievement.

The proficiency level of the student, NEP/LEP/FEP, was determined by scores assessed by the most recent administration of either the LAS II or the IPT II which was also a requirement for entrance into the ESL program. Level specifications for all seventy-one students were available. In addition to the proficiency level specified by NEP/LEP/FEP for each student, numerical levels 1/2/3/4 had
also been assigned for each student. The 1 corresponded with the Non-English Proficiency level, the 2 and 3 corresponded with the low and high levels of Limited-English Proficiency level and the 4 corresponded with the Fluent-English Proficiency level. The numerical values described herein were used for calculations. The numerical assignments were found for all seventy-one students in the proposed population on the Classroom Summary Roster for ESL which was in the records kept by the Secondary ESL Coordinator of the district.

The culture or first language of each student was also recorded on the Classroom Summary Roster for ESL. This record was compared with each individual's Home Language Survey Form in order to check for accuracy for inclusion in the population. One student who did speak Spanish in the home was not included in the study since his ethnolinguistic category was considered Portugese; Spanish was his second language and Portugese his first language. Cultures were later assigned a numeric value in order to do certain statistical procedures. The numbers were assigned alphabetically/numerically: Laotian/11, Spanish/12, Tongan/13 and Vietnamese/14.

Students' cognitive learning style, field-dependence or field-independence, was determined by the administration of the GEFT. Only sixty-eight of the eligible seventy-one students were tested with the GEFT. The final population of
the study was sixty-eight. Three samples of geometric designs were drawn on the chalk board for each class prior to each testing period. Each sample was explained several different ways by both the ESL teacher and the test administrator. Questions could be asked during this time and were answered accordingly. Due to the language barrier, it was imperative that all students understood what was expected of them. The test was then administered according to the directions given in the test manual (Witkin, Oltman, Raskin, and Karp; 1977) with exception of an extended time period of five minutes on the first section, which was not part of the students' scores.

Each student's sex was identified on the identification information requested on the GEFT. All other data including student grade level and time in the ESL program were obtained from the Classroom Summary Roster for ESL previously mentioned in this chapter.

Scoring Procedures

The language and reading percentile scores on the CAT were obtained for each subject. The most recent administration of the CAT for the individual was in February 1985, September 1984, May 1984, or at the time the student entered the school district if the student registered after September 1984. The February date of the CAT administration was for students in the seventh, ninth, and eleventh grade
only. The language score included the areas of spelling, language mechanics, and language expression. A total of sixty-three questions was used in this section. The reading score included both reading vocabulary and reading comprehension. A total of seventy questions was used in this area.

GEFT scores were obtained from the GEFT test which was taken by the sixty-eight subjects of this study in April 1985. Witkin's et al. (1971) scale was used to identify field-dependence/field-independence. Students whose scores ranged from zero to nine were identified as field-dependent, students whose scores ranged from ten to eighteen were identified as field-independent. Actual scores were retained for further correlations. Field-dependence and field-independence were assigned numeric values of (1) and (2) respectively for some statistical procedures.

The LAS II or IPT II tests were administered individually at approximately the same time period as the CAT had been administered: May 1984, September 1984, or upon the student's entrance in the school district. Scores for the LAS II were obtained and translated to proficiency levels of NEP/LEP/FEP and levels of 1/2/3/4/5 according to the examiner's manual (Duncan and DeAvila, 1978). The IPT II scores of A/B/C/D/E/F/M were obtained from the test scores and translated to the proficiency levels of NEP/LEP/FEP according to the examiner's manual (Ballard,
Tighe, and Dalton; 1979). The IPT II scores were also converted to levels of 1/2/3/4/5 according to the same manual.

Procedures for Analysis of Data

This study was designed to determine the differences and similarities of ESL students in four selected ethnolinguistic groups: Laotian, Spanish, Tongan and Vietnamese. The study was also designed to identify the cognitive learning style of each student in each cultural group. The study was further designed to determine what relationships exist between students' cognitive learning style and students' grade level, time in an ESL program, sex, proficiency level, culture and achievement in ESL (reading and language). In addition to these relationships, it was designed to determine what relationships exist between students' ethnolinguistic association and students' grade level, time in an ESL program, sex, proficiency level, learning style, GEFT scores, and achievement in reading and language. The following statistical procedures were employed.

The Pearson product-moment correlation coefficients were calculated for all numeric variables: reading and language scores for the CAT, proficiency level, grade level, months in the ESL program, and scores on the GEFT. The resulting correlations were checked for significance at the
.05 level. Variables of sex, learning style, and culture were changed to numeric variables in order to calculate correlation coefficients. The sex identifiers (F) and (M) were converted to (1) and (2) respectively, as were the the learning styles of field-dependence (1) and field-independence (2). Cultures were alphabetically assigned the values of (11) to (14). Illustrations of correlation coefficients were displayed in tables. Direction and significance of each correlation was determined.

Multilinear regression analysis for a two attribute model, with one attribute ordered was employed for further data analysis and testing of the hypotheses. Crosstabulations and scattergrams were produced for a visual representation for some of the data.

Finally, stepwise multiple correlations were performed in order to determine the best predictor of reading achievement and language achievement in ESL, and to determine if culture or learning style was a predicting factor of achievement in English as a second language.

The statistical analysis was computerized using SAS, Statistical Analysis System, (Helwig, 1983). The data are presented in tabular form. From the findings, conclusions are drawn, educational implications are stated, and recommendations are made.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

PRESENTATION OF THE FINDINGS

The problem of this study was to determine the relationship of field-independent and field-dependent cognitive learning style and achievement of ESL secondary students from four selected ethnolinguistic groups. It was further designed to determine if the variables of culture, grade level, time in an ESL program, sex, or language proficiency level had a significant relationship to the achievement of these students in English.

The population was divided into four selected ethnic groups of Laotian, Spanish, Tongan and Vietnamese. Table I gives the number (N), the mean (M), and standard deviation (SD) for the CAT reading scores, the CAT language scores, and the GEFT scores for each cultural group. The mean (M) and standard deviations (SD) for the combined scores of the CAT language, CAT reading, and the combined scores for the GEFT were obtained for all of the subjects in the study. These results were also recorded on Table I. The mean for the two Southeast Asian cultures, Laotian and Vietnamese, were both higher on the CAT language score and the GEFT and lower on the CAT reading score than either the Spanish or the Tongan. The mean of the two Southeast Asian
TABLE I

NUMBER OF SUBJECTS, MEANS, AND STANDARD DEVIATIONS FOR THE CAT READING, CAT LANGUAGE AND GEFT OF THE FOUR SELECTED CULTURES

<table>
<thead>
<tr>
<th>Culture</th>
<th>N</th>
<th>M Language SD</th>
<th>M Reading SD</th>
<th>M GEFT SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>25</td>
<td>15.80</td>
<td>8.80</td>
<td>6.72</td>
</tr>
<tr>
<td>Spanish</td>
<td>13</td>
<td>13.61</td>
<td>18.23</td>
<td>5.69</td>
</tr>
<tr>
<td>Tongan</td>
<td>13</td>
<td>14.15</td>
<td>14.92</td>
<td>6.15</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>17</td>
<td>18.35</td>
<td>9.58</td>
<td>7.11</td>
</tr>
<tr>
<td>Totals</td>
<td>68</td>
<td>15.70</td>
<td>11.97</td>
<td>6.51</td>
</tr>
</tbody>
</table>

cultures were also higher than the group mean on both language achievement and GEFT scores and lower than the group mean in reading achievement.

Table II substantiates this same phenomenon when range of scores are considered. The Vietnamese exhibited the

TABLE II

RANGE OF SCORES FOR THE CAT READING, CAT LANGUAGE AND THE GEFT OF THE FOUR SELECTED CULTURES

<table>
<thead>
<tr>
<th>Culture Group</th>
<th>Language Low</th>
<th>Language High</th>
<th>Reading Low</th>
<th>Reading High</th>
<th>GEFT Low</th>
<th>GEFT High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>0</td>
<td>42</td>
<td>0</td>
<td>35</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Spanish</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>47</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Tongan</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>44</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>0</td>
<td>62</td>
<td>0</td>
<td>40</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>62</td>
<td>0</td>
<td>47</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>
greatest range in language scores, from zero to sixty-two. The Laotian range of language scores were from zero to forty-two. The Spanish and Tongan had a range of only zero to thirty and zero to thirty-three respectively. The opposite effect was shown for the reading scores; the Spanish reading scores range was from zero to forty-seven, and the Tongan from zero to forty-four. The Southeast Asians were close behind with Vietnamese range from zero to forty and Laotian range from zero to thirty-five. There was greater variability in language scores than reading scores for ESL students of different cultures.

Pearson product-moment correlation coefficients (r) were calculated for these three scores for the entire group as well as for each culture. These correlation coefficients are shown in Table III. There are significant positive correlations between the GEFT scores and the language scores for both the Laotians and the Tongan. Although the GEFT was not correlated significantly with the reading scores of any of the four cultures, the language and reading scores were significantly correlated with each other and three of the four cultures, Laotian, Tongan, and Vietnamese. The scores of the CAT language, CAT reading and GEFT showed no significant correlation for the Spanish culture subjects. The total population showed a significant positive correlation between the GEFT and CAT language scores (r = .41) as well as between the CAT language and CAT
TABLE III
A MATRIX OF CORRELATION COEFFICIENTS OF CAT READING, CAT LANGUAGE AND THE GEFT SCORES FOR THE FOUR SELECTED CULTURES

<table>
<thead>
<tr>
<th>Culture</th>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>1.00</td>
<td>.74*</td>
<td>.43*</td>
</tr>
<tr>
<td>Spanish</td>
<td>1.00</td>
<td>.32</td>
<td>.22</td>
</tr>
<tr>
<td>Tongan</td>
<td>1.00</td>
<td>.71*</td>
<td>.59*</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>1.00</td>
<td>.47*</td>
<td>.38</td>
</tr>
<tr>
<td>Total</td>
<td>1.00</td>
<td>.47*</td>
<td>.41*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>1.00</td>
<td>.25</td>
</tr>
<tr>
<td>Spanish</td>
<td>.32</td>
<td>1.00</td>
</tr>
<tr>
<td>Tongan</td>
<td>.71*</td>
<td>1.00</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>.47*</td>
<td>1.00</td>
</tr>
<tr>
<td>Total</td>
<td>.47*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>.43*</td>
<td>.25</td>
</tr>
<tr>
<td>Spanish</td>
<td>.22</td>
<td>.22</td>
</tr>
<tr>
<td>Tongan</td>
<td>.59*</td>
<td>.23</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>.38</td>
<td>.40</td>
</tr>
<tr>
<td>Total</td>
<td>.41*</td>
<td>.21</td>
</tr>
</tbody>
</table>

* Statistically significant at p < .05.

reading scores \( r = .47 \), but not between the CAT reading and the GEFT \( r = .21 \). Relationships of this nature may be examined by plotting the paired measurements, each pair of observation being represented by a labeled point. Such a plotting of measurements results in a scatter diagram. A scatter diagram of this same information as seen in Figure 1 gives a visual representation of the distribution of the four cultures for the CAT reading and CAT language scores representing achievement. A departure from the linear model can readily be detected by inspection of a scatter diagram.
Fig. 1 -- A comparison of California Achievement Test reading and language percentile scores for English as a second language students from four selected cultures according to culture.

* Due to clustering scores near the origin, 14 students are not identified.
It can easily be noted that the highest scores in language were displayed by Vietnamese and followed by Laotian. The highest score for Tongan was at the Language/Reading coordinates 33/27. The highest language score for Spanish was at the Language/Reading coordinates 30/25.

It would be important to note that Spanish students excelled more in reading as was evident in Figure 1 and Table I with the high reading score of 47 and a mean on CAT reading of 18.23. The majority, sixty-nine percent, of the Spanish students' scores was above the fifteenth percentile in reading. Only thirty-eight percent Tongan, twenty percent Laotian, and eighteen percent Vietnamese scored above the fifteenth percentile in reading achievement. It appears that if only one or the other variable, CAT reading or CAT language was used for ESL achievement level, it could result in contradictory results for different cultures, especially evident in this study for the Spanish students.

The entire population was also divided into female and male subgroups. Table IV presents the number (N), the mean (M), and the standard deviation (SD) for the same three sets of scores previously discussed, CAT language, CAT reading, and GEFT, according to sex. The table indicated no significant differences on any of these scores except for the GEFT mean scores. The male's mean was 7.02 and the
TABLE IV

NUMBER OF STUDENTS, MEANS, AND STANDARD DEVIATIONS FOR THE CAT READING, CAT LANGUAGE AND GEFT ACCORDING TO SEX

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>M Language SD</th>
<th>M Reading SD</th>
<th>M GEFT SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>25</td>
<td>16.28</td>
<td>13.99</td>
<td>11.96</td>
</tr>
<tr>
<td>Males</td>
<td>43</td>
<td>15.37</td>
<td>14.94</td>
<td>11.97</td>
</tr>
<tr>
<td>Totals</td>
<td>68</td>
<td>15.70</td>
<td>14.47</td>
<td>11.97</td>
</tr>
</tbody>
</table>

female's mean was only 5.64. This difference does become more substantial with the consideration that the range of the GEFT is only 0 to 16. Both means are in the range of the field-dependent learning style; therefore one group could not be considered more field-independent than the other. However, the female group could be identified as having a greater tendency toward field-dependence than males since the range of field-dependence is 0 to 8.

Subjects were likewise divided into grade levels as shown in Table V by number (N) in each grade, mean (M), and standard deviation (SD) on the three tests in consideration. The comparison of means by grade level shows the eighth grade group of students having a higher mean than any other group on both the CAT language and CAT reading. The higher mean on the GEFT were for the ninth (7.43) and tenth (7.37) graders with the eighth grade group of students having the lowest mean of 5.10. Again, all mean scores of the GEFT
TABLE V

NUMBER OF STUDENTS, MEANS, AND STANDARD DEVIATIONS FOR THE CAT READING, CAT LANGUAGE AND GEFT ACCORDING TO GRADE LEVELS

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>N</th>
<th>M</th>
<th>Language SD</th>
<th>M</th>
<th>Reading SD</th>
<th>M</th>
<th>GEFT SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seventh</td>
<td>8</td>
<td>16.87</td>
<td>14.32</td>
<td>4.37</td>
<td>7.26</td>
<td>5.37</td>
<td>3.73</td>
</tr>
<tr>
<td>Eighth</td>
<td>10</td>
<td>19.80</td>
<td>11.40</td>
<td>22.90</td>
<td>15.18</td>
<td>5.10</td>
<td>3.03</td>
</tr>
<tr>
<td>Ninth</td>
<td>16</td>
<td>16.81</td>
<td>18.74</td>
<td>11.68</td>
<td>10.24</td>
<td>7.43</td>
<td>5.11</td>
</tr>
<tr>
<td>Tenth</td>
<td>16</td>
<td>14.12</td>
<td>11.59</td>
<td>11.93</td>
<td>9.92</td>
<td>7.37</td>
<td>4.48</td>
</tr>
<tr>
<td>Eleventh</td>
<td>12</td>
<td>14.41</td>
<td>15.86</td>
<td>10.83</td>
<td>13.05</td>
<td>6.00</td>
<td>4.51</td>
</tr>
<tr>
<td>Twelfth</td>
<td>6</td>
<td>11.16</td>
<td>14.10</td>
<td>7.00</td>
<td>13.74</td>
<td>6.66</td>
<td>3.01</td>
</tr>
<tr>
<td>Totals</td>
<td>68</td>
<td>15.70</td>
<td>14.47</td>
<td>11.97</td>
<td>12.30</td>
<td>6.51</td>
<td>4.23</td>
</tr>
</tbody>
</table>

fall in the area of field-dependence. An interpretation of the eighth grade scores alone would reveal greater achievement in second language learning for field-dependent learners. Relationships of this type should be closely scrutinized with studies of cognitive development stages to determine any underlying variables which might exist at this particular stage, age, or grade level.

Subjects of this study were also categorized into proficiency levels of Non-English-Proficient (NEP), Limited-English-Proficient (LEP), and Fluent-English-Proficient (FEP). All levels were given numeric equivalency with LEP subdivided into low (2) and high (3) levels. NEP and FEP were assigned (1) and (4) respectively. The number (N), mean (M), and standard deviation (SD) for the CAT
As proficiency levels increased from one to four, the mean of all three tests increased. Correlation coefficients for the four proficiency levels with relationship to these three test scores are shown in Table VII.

Significant positive correlations were evident for proficiency levels NEP-1 and LEP-2 with regard to CAT reading and CAT language. The correlation coefficients on these two scores for the overall population was also significant at p < .05. The entire group correlation of the GEFT and the CAT language appears to have been highly influenced by FEP-4 level's perfect negative correlation. Since the population of the level 4 resulted in only two
TABLE VII

A MATRIX OF CORRELATION COEFFICIENTS OF CAT READING, CAT LANGUAGE AND GEFT SCORES FOR THE FOUR PROFICIENCY LEVELS

<table>
<thead>
<tr>
<th>Proficiency Level</th>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEP - 1</td>
<td>1.00</td>
<td>.85*</td>
<td>.37</td>
</tr>
<tr>
<td>LEP - 2</td>
<td>1.00</td>
<td>.47*</td>
<td>.35</td>
</tr>
<tr>
<td>LEP - 3</td>
<td>1.00</td>
<td>.18</td>
<td>.35</td>
</tr>
<tr>
<td>FEP - 4</td>
<td>1.00</td>
<td>-1.00*</td>
<td>-1.00*</td>
</tr>
<tr>
<td>Total</td>
<td>1.00</td>
<td>.47*</td>
<td>.41*</td>
</tr>
</tbody>
</table>

| NEP - 1           | .85*       | 1.00      | .17    |
| LEP - 2           | .47*       | 1.00      | .27    |
| LEP - 3           | .18        | 1.00      | .005   |
| FEP - 4           | -1.00*     | 1.00      | 1.00*  |
| Total             | .47*       | 1.00      | .21    |

| NEP - 1           | .37        | .17       | 1.00   |
| LEP - 2           | .35        | .27       | 1.00   |
| LEP - 3           | .35        | .005      | 1.00   |
| FEP - 4           | -1.00*     | 1.00*     | 1.00   |
| Total             | .41*       | .21       | 1.00   |

* Statistically significant at p < .05.

students and the correlations were all perfect correlations of +1 or -1 it might be interesting to view the data for these two individuals. Table VIII presents the data for these two subjects.

It illustrates that one student had a higher percentile score on CAT language and the other student had a higher percentile score on CAT reading and a higher score on the GEFT. This accounts for the perfect negative correlations
TABLE VIII

DATA FOR THE TWO STUDENTS
AT FEP-LEVEL 4

<table>
<thead>
<tr>
<th>Student Culture</th>
<th>Sex</th>
<th>Grade</th>
<th>Learning Style</th>
<th>Months in ESL</th>
<th>CAT Read.%</th>
<th>CAT Lang.%</th>
<th>GEFT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish</td>
<td>M</td>
<td>8</td>
<td>F/Dep.</td>
<td>5</td>
<td>25</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>Tongan</td>
<td>M</td>
<td>9</td>
<td>F/Ind.</td>
<td>17</td>
<td>26</td>
<td>26</td>
<td>15</td>
</tr>
</tbody>
</table>

of the CAT language with the GEFT and the CAT language with
the CAT reading, and the perfect positive correlation of the
CAT reading with the GEFT. Although two subjects in a
subgroup is not statistically sound, the remainder of Table
VII can be quite useful and informative. A visual
representation, Figure 2, further illustrates the two FEP-4
level students embedded in a cluster of LEP-2 and LEP-3
students. LEP 2 and 3 students also occupy all the extreme
positions on both the language and reading axis. The FEP-4
students are certainly not the highest achieving students in
either reading or language. The proficiency level assigned
to these two students just illustrates their high level of
verbal ability and communicative competency.

There are twelve months difference in the time that
these two students were enrolled in the ESL program, yet
their reading and language scores were both very close and
were both above the mean score of the entire population.
Previous research has shown there are a multitude of
Fig. 2 -- A comparison of California Achievement Test reading and language percentile scores for English as a second language students from four selected cultures according to second language proficiency level.

* Due to clustering scores near the origin, 14 students are not depicted.
variables outside of the classroom affecting the individual acquiring communicative competency.

Subjects were further subdivided into number of months in the ESL program in order to study this relationship with achievement. Twenty-one of the sixty-eight students had been enrolled in ESL for eight months, while the next highest frequency of 14 students had been in the ESL program for the entire twenty months that the program had been established. Twenty students had been in ESL for less than eight months and thirteen others had been in the program from eleven to nineteen months. The relationship of the number of months in ESL to achievement will be discussed further in testing Hypothesis Nine.

Students in the study were finally identified as field-independent or field-dependent learners by scores from the GEFT. The correlation coefficient ($r = .80$) between learning style and the GEFT score, used for identifying the style, was a significant positive correlation. This study identified sixteen field-independent learners and fifty-two field-dependent learners. The mean of CAT language scores for the field-independent learner was 28.12; the mean of the same scores for the field-dependent learner was 11.88. The mean of CAT reading scores for the field-independent learner was 16.75 and for the field-dependent learner, 10.50. The GEFT mean for field-independent learners was 12.62 and for field-dependent learners it was 4.63.
The field-independent CAT language scores had a range of fifty-five while field-dependent language scores had a range of only forty-eight. Reading scores showed the reverse trend with field-independent learners' range being thirty-four which was less than the field-dependent range of forty-seven. Figure 3 further illustrates the range of scores for each style learner, field-independent (I) and field-dependent (D). Inspection of the scatter diagram yields an intuitive appreciation of the degree of relation between the two variables, language scores and reading scores with respect to learning style. The field-dependent learners exceeded in reading achievement while the field-independent learners had a tendency to excel in language achievement. This supports Hansen and Stansfield's hypothesis that the cognitive and social/psychological traits characterizing either style preference seemed implicated in the development of an integrated language proficiency. It does confirm that the style factor influences second language learning in different ways depending on the particular language skills required.

Testing of Hypotheses

Pearson product-moment correlations were calculated to test all hypotheses. The Pearson product-moment correlation (r) is one of the most stable correlation techniques with the smallest standard error. A correlational relationship
Fig. 3 – A comparison of California Achievement Test reading and language percentile scores for English as a second language students from four selected cultures according to cognitive learning style, field-dependent or field-independent.

* Due to clustering scores near the origin, 14 students are not shown.
does not necessarily imply a cause-and-effect relationship between two variables; but, instead, it attests to an associational link and may furnish clues to the causes. Correlation analysis is used to measure the strength of the relationship between two variables. When two variables are positively correlated, observations that have high values of one variable also tend to have high values of the other variable. When two variables are not correlated, there is no apparent linear relationship between the values of one and the values of the other. When two values are negatively correlated, high values of one variable tend to be associated with low values of the other value. Pearson product-moment correlation coefficients were calculated for all numeric variables.

In order to test all nine hypotheses with correlation coefficients, the values of the categorical variables of sex, learning-style and culture were arbitrarily assigned numbers. The numeric values to the two and four valued variables did place restrictions on the range of values that the correlation could assume since the number (N) for many subgroups of the population were small or less than thirty. Due to this limitation, a multiple-linear regression technique was employed to further test Hypotheses One, Five, Seven, and Nine. This procedure yielded a multiple regression equation that combined the predictive value of several measures into a single formula. The multiple
regression equation weighs each variable in terms of its importance in making the desired prediction. The dependent variable is spoken of as the criterion. The various independent variables are predictors. The multiple correlation coefficient is designated by \( R \).

Hypothesis One stated that there would be a significant positive correlation between field-independence and achievement in ESL. The result \( r = .47 \) for the relationship between learning style and CAT language scores show a significant positive correlation between field-independence and achievement in language for the total population. A correlation coefficient for CAT reading and learning style \( r = .21 \) was not significant.

A multiple-linear regression was also used to test Hypothesis One. Learning style was used as the criterion measure to test for the predictability of achievement as defined by CAT reading scores and CAT language scores. Due to the limitations of using a criterion of a dichotomous nature, the GEFT score used to identify the variables of the dichotomy was also used as a criterion. The coefficients \( r = .47 \) for the language score/learning style and \( r = .41 \) for the language score/GEFT score relationships are significant at \( p < .0001 \) and \( p < .0004 \) respectively. The reading score coefficients with the criterion of learning style \( r = .21 \) and with the criterion of the GEFT \( r = .21 \) are statistically significant at \( p < .07 \), which
does not meet the significance criteria of this study.

The multiple regression also measures how much variation in the dependent variable can be accounted for by the model. Language achievement accounts for seventeen percent of the variation in learning style and twenty-two percent of the variation on the GEFT scores. Reading achievement, which was not statistically significant at p < .05 with learning styles or the GEFT, can account for only four percent of the variation in these models.

When achievement is defined as scores from the reading subtest of the CAT, Hypothesis One is rejected. When achievement is defined as the scores from the language subtest of the CAT, Hypothesis One is retained.

Hypothesis Two stated there would be no significant difference in field dependence between ESL students of the four cultures: Laotian, Spanish, Tongan, and Vietnamese. In addition to Tables I and II, a cross-tabulation in Table IX reveals a percentage distribution of each learning style by the culture. The table indicates 76.47 percent of the population was of the field-dependent learning style and only 23.53 percent were of the field-independent style. The exact same ratio existed for the Vietnamese culture and the Tongan had 76.92 percent field-dependent and 23.08 field-independent. The Laotian group had a slight tendency to be more field-independent than the overall group or of the two other subgroups previously mentioned.
TABLE IX

A CROSSTABULATION OF FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE BY CULTURES

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Cultures</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Laotian</td>
<td>Spanish</td>
</tr>
<tr>
<td>Field-Dependent</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>(N)</td>
<td>26.47</td>
<td>16.18</td>
</tr>
<tr>
<td>%</td>
<td>34.62</td>
<td>21.15</td>
</tr>
<tr>
<td>Row %</td>
<td>72.00</td>
<td>84.62</td>
</tr>
<tr>
<td>Column %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field-Indep.</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>(N)</td>
<td>10.29</td>
<td>2.94</td>
</tr>
<tr>
<td>%</td>
<td>43.75</td>
<td>12.50</td>
</tr>
<tr>
<td>Row %</td>
<td>28.00</td>
<td>15.38</td>
</tr>
<tr>
<td>Column %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (N)</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Total %</td>
<td>36.76</td>
<td>19.12</td>
</tr>
</tbody>
</table>

The Spanish showed a ratio of field-dependent/field-independent learners that was quite different from the group ratio. The Spanish showed a greater tendency toward field-dependence than any of the other culture groups.

In order to determine significant differences between cultures, correlation coefficients (r) were calculated and displayed in Table X for each ethnolinguistic group to determine the relationships between the learning style variable and the variables of CAT language scores, CAT reading scores, and the GEFT. The coefficients for the total population were also included on Table X for these variables.
TABLE X

A MATRIX OF CORRELATION COEFFICIENTS OF CAT READING, CAT LANGUAGE, GEFT SCORES AND LEARNING STYLE
FOR THE FOUR SELECTED CULTURES

<table>
<thead>
<tr>
<th>Culture</th>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
<th>Learning Style r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>1.00</td>
<td>.74*</td>
<td>.43*</td>
<td>.56*</td>
</tr>
<tr>
<td>Spanish</td>
<td>1.00</td>
<td>.32</td>
<td>.22</td>
<td>.42</td>
</tr>
<tr>
<td>Tongan</td>
<td>1.00</td>
<td>.71*</td>
<td>.59*</td>
<td>.40</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>1.00</td>
<td>.47*</td>
<td>.38</td>
<td>.47</td>
</tr>
<tr>
<td>Total</td>
<td>1.00</td>
<td>.47*</td>
<td>.41*</td>
<td>.47*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
<th>Learning Style r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>.74*</td>
<td>.25</td>
<td>.39*</td>
</tr>
<tr>
<td>Spanish</td>
<td>.32</td>
<td>.22</td>
<td>.27</td>
</tr>
<tr>
<td>Tongan</td>
<td>.71*</td>
<td>.23</td>
<td>.02</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>.47*</td>
<td>.40</td>
<td>.37</td>
</tr>
<tr>
<td>Total</td>
<td>.47*</td>
<td>.21</td>
<td>.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
<th>Learning Style r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>.43*</td>
<td>1.00</td>
<td>.79*</td>
</tr>
<tr>
<td>Spanish</td>
<td>.22</td>
<td>.22</td>
<td>.66*</td>
</tr>
<tr>
<td>Tongan</td>
<td>.59*</td>
<td>.23</td>
<td>.89*</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>.38</td>
<td>.40</td>
<td>.84*</td>
</tr>
<tr>
<td>Total</td>
<td>.41*</td>
<td>.21</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
<th>Reading r</th>
<th>GEFT r</th>
<th>Learning Style r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laotian</td>
<td>.56*</td>
<td>.39*</td>
<td>.79*</td>
</tr>
<tr>
<td>Spanish</td>
<td>.42</td>
<td>.27</td>
<td>.66*</td>
</tr>
<tr>
<td>Tongan</td>
<td>.40</td>
<td>.02</td>
<td>.89*</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>.47</td>
<td>.37</td>
<td>.84*</td>
</tr>
<tr>
<td>Total</td>
<td>.47*</td>
<td>.21</td>
<td>.80*</td>
</tr>
</tbody>
</table>

* Statistically significant at p < .05.

This table does establish the significant correlation of the GEFT scores and learning styles for the total population (r = .80) and for each culture. It also illustrates the significant correlations of the learning style variable of the Laotian culture with both CAT language (r = .56) and CAT reading scores (r = .39). Correlations of learning style and achievement with other cultures were not significant. This result may have been due to the numbers
in each subgroup which were displayed in Table I.
Correlations between CAT language and CAT reading scores were significant for all cultures except Spanish ($r = .32$); correlations between CAT language and GEFT scores, the learning style determinant, were significant for the Laotian ($r = .43$) and Tongan ($r = .59$), but was not significant for the Vietnamese ($r = .38$) or the Spanish ($r = .22$). It appears from these correlations that this Spanish group does differ from the other three culture groups in achievement correlations. Although there are some differences that exist it is not necessarily a result of culture. A stepwise multiple correlation was applied to determine the amount of prediction that culture or learning style had on the achievement of reading and language skills. Culture was not a predictor at $p < .05$. In testing Hypothesis Two a stepwise multiple regression was employed and correlation coefficients were calculated between culture and the multiple variables of CAT language, CAT reading, GEFT, and learning style. No significant correlations to culture were evident; therefore, Hypothesis Two, a null hypothesis, was retained.

Hypothesis Three stated that there would be no significant difference in field-dependence between male and female students enrolled in the ESL program. Table XI presents the correlation coefficients between the learning style variable and the variables of CAT language, CAT
reading, and GEFT, for both the male and female subjects as well as for the entire population. It also presents correlation coefficients between these same variables and the variable of sex for the entire population.

**TABLE XI**

**CORRELATION COEFFICIENTS OF LEARNING STYLE, CAT LANGUAGE, CAT READING AND GEFT SCORES ACCORDING TO SEX**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Language $r$</th>
<th>Reading $r$</th>
<th>GEFT $r$</th>
<th>Learning Style $r$</th>
<th>Learning Style $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>.47*</td>
<td>.16</td>
<td>.83*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>.50*</td>
<td>.30</td>
<td>.74*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.47*</td>
<td>.21</td>
<td>.80</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.03</td>
<td>.0006</td>
<td>.15</td>
<td>.06</td>
<td>Sex $r$</td>
</tr>
</tbody>
</table>

* Statistically significant at $p < .05$.

The learning style of males was significantly correlated with language, but not reading. The same was true for female students. In viewing the total population, sex was not significantly correlated with any of the variables of this study including language achievement, reading achievement or learning style. With this evidence, the null hypothesis as stated in Hypothesis Three was retained.

Hypothesis Four stated that there would be no significant difference in the mean achievement scores between male and female students enrolled in the ESL program. Although there is less than one point difference
in means, the statistical procedure most often used to test significance of differences between means of a number of different populations is an analysis of variance. In this study the variation of sex to language achievement and reading achievement was computed by using SAS Mean Procedure and the GLM which yielded a variance and coefficient of variance for each sex. The same procedure was used in relationship to the variables of language and reading. No statistically significant difference was found between achievement scores for male and female students in ESL; therefore, Hypothesis Four as stated in the null hypothesis form was retained.

Hypothesis Five stated that there would be a significant positive correlation between second language proficiency level and second language achievement scores of CAT reading and CAT language. The correlation coefficients between the two achievement variables for each proficiency level is displayed in Table XII. The perfect negative correlation for FEP-4 was the result of two students with opposite scores on the reading and language tests. For the total population significant positive correlations existed between variables of proficiency level and reading achievement (r = .57) and between proficiency level and language achievement (r = .49). Table XII also shows a significant positive correlation between CAT reading score
TABLE XII

A MATRIX OF CORRELATION COEFFICIENTS FOR CAT READING AND LANGUAGE SCORES ACCORDING TO PROFICIENCY LEVEL

<table>
<thead>
<tr>
<th>Proficiency Level</th>
<th>Language r</th>
<th>Reading r</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEP - 1</td>
<td>1.00</td>
<td>.85*</td>
</tr>
<tr>
<td>LEP - 2</td>
<td>1.00</td>
<td>.47*</td>
</tr>
<tr>
<td>LEP - 3</td>
<td>1.00</td>
<td>.18</td>
</tr>
<tr>
<td>FEP - 4</td>
<td>1.00</td>
<td>-1.00*</td>
</tr>
<tr>
<td>Total</td>
<td>1.00</td>
<td>.47*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>.57*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>.49*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proficiency Level r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>.49*</td>
</tr>
</tbody>
</table>

* Statistically significant at $p < .05$.

and CAT language scores for the total population ($r = .47$) and for proficiency levels NEP-1 ($r = .85$) and LEP-2 ($r = .47$). A stepwise multiple correlation procedure determined that proficiency level was the one-best predictor of both reading and language scores. In this study, proficiency level has a prediction value of thirty-three percent for reading achievement and a prediction value of twenty-four percent for language achievement. Both are significant at $p < .0001$. Due to both significant correlation coefficients for proficiency levels presented in Table XII and the prediction values of proficiency levels for reading and language achievement Hypothesis Five was retained.

Hypothesis Six stated that there would be a significant positive correlation between field-independence and the grade level of the students enrolled in ESL with students in
grades ten, eleven and twelve demonstrating more field-independence than students in grades seven, eight and nine. Correlation coefficients of grade level and learning style ($r = .03$) and grade level and the GEFT score ($r = .08$) for the entire population were not significant at $p < .05$. Hypothesis Six was rejected.

Hypothesis Seven stated that there would be a significant positive correlation between achievement and the grade level of the students enrolled in ESL with the students in grades ten, eleven and twelve exhibiting more achievement than students in grades seven, eight and nine. Correlation coefficients for the total population between grade level and reading ($r = -.08$) and grade level and language ($r = -.13$) reveal a negative correlation between achievement and grade level. The interpretation would be that achievement scores were increased as grade levels were decreased. These coefficients were not significant at $p < .05$.

It has previously been established that reading and language scores have a positive correlation with one another which was significant for the entire population as shown in Tables III, X, and XII. When the population was divided by grade levels, different grades exhibited different correlations of these achievement variables as displayed in Table XIII. The total population was significantly correlated in reading and language according to grade level,
but significant correlations of the two achievement variables, reading and language, were evident only at the eighth grade, ninth grade and twelfth grade.

**TABLE XIII**

**CORRELATION COEFFICIENTS OF CAT READING AND LANGUAGE SCORES ACCORDING TO GRADE LEVEL**

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Reading/Language r</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>.67</td>
</tr>
<tr>
<td>8</td>
<td>.63 *</td>
</tr>
<tr>
<td>9</td>
<td>.70 *</td>
</tr>
<tr>
<td>10</td>
<td>.21</td>
</tr>
<tr>
<td>11</td>
<td>.15</td>
</tr>
<tr>
<td>12</td>
<td>.97 *</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>.47 *</td>
</tr>
</tbody>
</table>

* Statistically significant at p < .05.

Since achievement is usually not affected by a single factor, but rather by a complex of factors which themselves may influence each other in complex ways a multiple-linear regression technique was employed. The technique used was a stepwise multiple correlation procedure. It was used in order to statistically explore the strength of relationships between several independent variables and one dependent variable. In applying this procedure the best predictor is paired with every other predictor in turn and a multiple correlation calculated for each pair of predictors. This multivariate correlational method allows an exploration and description of the relationships between three or more variables. In this study the stepwise correlation procedure compared the relationships of seven variables to the
achievement variables of language and reading. This was instrumental in testing further Hypotheses One, Five, Seven, and Nine. In using stepwise multiple correlation, tests of significance are applied to determine whether the addition of one or more variables add significantly to the multiple correlation. The SAS application of stepwise multiple correlation began with all predictors of the criterion and ascertained progressively what degree of prediction is lost when additional variables are dropped.

With reading achievement as the criterion all independent variables of culture, grade level, GEFT score, learning style, months in ESL, proficiency level, and sex were tested for the best one-variable predictor model, the best two-variable predictor model, and finally, the best three-variable predictor model. The same procedure was applied to the model using language achievement as the criterion. Results are shown in Table XIV. Proficiency level was the best one-variable predictor for both reading and language achievement significant at p < .0001. Months in ESL was the second-best predictor for reading scores and learning style was the second-best predictor for language scores. Grade level was the third-best predictor for both reading and language scores, but not significant at p < .05. On the SAS output, a negative sign of the beta coefficient indicated that grade level was more of a predictor at the lower grade levels than higher grade levels. In this
### TABLE XIV

PREDICTORS OF CAT READING AND CAT LANGUAGE SCORES

<table>
<thead>
<tr>
<th>Reading Predictors</th>
<th>N</th>
<th>Percent of Prediction</th>
<th>Total % of Prediction</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proficiency Level</td>
<td>1</td>
<td>.33</td>
<td>.33</td>
<td>32.98*</td>
<td>.0001</td>
</tr>
<tr>
<td>Months in ESL</td>
<td>2</td>
<td>.03</td>
<td>.37</td>
<td>4.09*</td>
<td>.04</td>
</tr>
<tr>
<td>Grade Level</td>
<td>3</td>
<td>.02</td>
<td>.39</td>
<td>2.36</td>
<td>.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language Predictors</th>
<th>N</th>
<th>Percent of Prediction</th>
<th>Total % of Prediction</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proficiency Level</td>
<td>1</td>
<td>.24</td>
<td>.24</td>
<td>21.17*</td>
<td>.0001</td>
</tr>
<tr>
<td>Learning Style</td>
<td>2</td>
<td>.12</td>
<td>.36</td>
<td>12.40*</td>
<td>.0008</td>
</tr>
<tr>
<td>Grade Level</td>
<td>3</td>
<td>.02</td>
<td>.38</td>
<td>2.33</td>
<td>.13</td>
</tr>
</tbody>
</table>

* Statistically significant at p < .05.

The situation the third variable of grade level contributes a negligible amount to the efficacy of prediction. The lack of correlation between grade level and the achievement variables for the entire population and data from Tables V, XIII, and XIV, Hypothesis Seven is rejected.

Hypothesis Eight stated that there would be a significant positive correlation between field-independence and the proficiency levels of ESL students with field-independent students having a higher degree of proficiency than field-dependent students. The correlation coefficient (r = .29) between proficiency level and learning style reveals a significant positive correlation between field-independence and higher levels of proficiency and a
significant positive correlation between field-dependence and lower proficiency levels. The scores on the GEFT used to determine cognitive learning styles showed a similar correlation coefficient \((r = .27)\). The existence of significant and positive correlations in this case is interpreted as an indication that the cognitive abilities associated to field-independence or high scores on the GEFT are perhaps being utilized to promote successful performances on verbal/aural communicative skills associated with proficiency levels as assessed by LAS II or IPT II. Based on significant correlation coefficients, Hypothesis Eight is retained.

Hypothesis Nine stated that there would be a significant positive correlation between achievement and the time in an ESL program with students who have been in the ESL program longer exhibiting more achievement. Pearson product-moment correlations were computed for all sixty-eight subjects to reveal any significant relationships between the number of months subjects were enrolled in the ESL program and proficiency level, GEFT scores, and achievement in reading and language. These correlations \((r)\) are displayed in Table XV. Significant positive correlations do exist between the months a student is enrolled in ESL and reading scores as well as between the months a student is enrolled in ESL and the proficiency
TABLE XV

A MATRIX OF CORRELATION COEFFICIENTS OF CAT READING, CAT LANGUAGE, GEFT SCORES AND PROFICIENCY LEVEL ACCORDING TO MONTHS IN ESL

<table>
<thead>
<tr>
<th>Months in ESL</th>
<th>Reading r</th>
<th>Language r</th>
<th>GEFT Level r</th>
<th>Proficiency Level r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.00</td>
<td>.53</td>
<td>.75</td>
<td>.87</td>
</tr>
<tr>
<td>2</td>
<td>1.00</td>
<td>.97</td>
<td>-.23</td>
<td>.88</td>
</tr>
<tr>
<td>5</td>
<td>1.00</td>
<td>.82</td>
<td>-.02</td>
<td>.93*</td>
</tr>
<tr>
<td>6</td>
<td>1.00</td>
<td>.99*</td>
<td>.95*</td>
<td>.87</td>
</tr>
<tr>
<td>8</td>
<td>1.00</td>
<td>.40</td>
<td>.16</td>
<td>.31</td>
</tr>
<tr>
<td>17</td>
<td>1.00</td>
<td>.99*</td>
<td>.60</td>
<td>.94*</td>
</tr>
<tr>
<td>19</td>
<td>1.00</td>
<td>.59</td>
<td>.18</td>
<td>.00</td>
</tr>
<tr>
<td>20</td>
<td>1.00</td>
<td>.004</td>
<td>-.32</td>
<td>.47</td>
</tr>
<tr>
<td>Total</td>
<td>1.00</td>
<td>.47*</td>
<td>.21</td>
<td>.57*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading r</th>
<th></th>
<th>Language r</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.53</td>
<td>1.00</td>
<td>.84</td>
<td>.87</td>
</tr>
<tr>
<td>2</td>
<td>.97</td>
<td>1.00</td>
<td>-.45</td>
<td>.97</td>
</tr>
<tr>
<td>5</td>
<td>.82</td>
<td>1.00</td>
<td>.47</td>
<td>.82</td>
</tr>
<tr>
<td>6</td>
<td>.99*</td>
<td>1.00</td>
<td>.95*</td>
<td>.88</td>
</tr>
<tr>
<td>8</td>
<td>.40</td>
<td>1.00</td>
<td>.20</td>
<td>.21</td>
</tr>
<tr>
<td>17</td>
<td>.99*</td>
<td>1.00</td>
<td>.55</td>
<td>.91*</td>
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<tr>
<td>19</td>
<td>.59</td>
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<td>.90</td>
<td>.80</td>
</tr>
<tr>
<td>20</td>
<td>.004</td>
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<td>-.04</td>
<td>-.27</td>
</tr>
<tr>
<td>Total</td>
<td>.47*</td>
<td>1.00</td>
<td>.41*</td>
<td>.49*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language r</th>
<th></th>
<th>GEFT r</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.91</td>
<td>.84</td>
<td>1.00</td>
<td>.91</td>
</tr>
<tr>
<td>2</td>
<td>-.23</td>
<td>-.45</td>
<td>1.00</td>
<td>-.65</td>
</tr>
<tr>
<td>5</td>
<td>-.02</td>
<td>.47</td>
<td>1.00</td>
<td>.20</td>
</tr>
<tr>
<td>6</td>
<td>.95*</td>
<td>.95*</td>
<td>1.00</td>
<td>.70</td>
</tr>
<tr>
<td>8</td>
<td>.16</td>
<td>.20</td>
<td>1.00</td>
<td>-.05</td>
</tr>
<tr>
<td>17</td>
<td>.60</td>
<td>.55</td>
<td>1.00</td>
<td>.70</td>
</tr>
<tr>
<td>19</td>
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<td>.90</td>
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<td>.98</td>
</tr>
<tr>
<td>20</td>
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<td>-.04</td>
<td>1.00</td>
<td>-.10</td>
</tr>
<tr>
<td>Total</td>
<td>.21</td>
<td>.41</td>
<td>1.00</td>
<td>.27*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GEFT r</th>
<th></th>
<th>Mo. in ESL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>.38*</td>
<td>.21</td>
</tr>
</tbody>
</table>

* Statistically significant at p < .05.

...
significant correlation between reading and language scores. Students at six months also showed a significant correlation between language scores and the GEFT scores, while students at seventeen months revealed a significant correlation between language and proficiency level. Students enrolled for five months showed a significant correlation between reading and proficiency level. There are certain peak periods in learning in relationship to time in an ESL program. A significant positive correlation ($r = .38$) between time in an ESL program and reading achievement is revealed in the table. The correlation coefficient between time in this ESL program and language achievement ($r = .21$) was not significant at $p < .05$. In review of Table XIV, the predictors of reading included months in ESL as the second best predictor with 4 percent predictability of reading achievement at a .04 significance level. Months in ESL was not one of the predictors of language achievement. Similar to Hypothesis One, the variable in question was significantly correlated with only one of the two variables of achievement. In opposition to Hypothesis One, Hypothesis Nine is rejected when achievement is based on CAT language scores; Hypothesis Nine is retained when achievement is defined in terms of reading.

This study suggests several implications for the educator. Since cognitive learning style of field-independence is significantly correlated with general
English language achievement including spelling, mechanics, and expression and not correlated with reading achievement, vocabulary and comprehension, of the CAT, it would seem to be to the benefit of ESL teachers to have students identified by cognitive learning style. This identification would enable the instructor to coordinate the present curriculum into a more individualized curriculum of versatile methodology and materials for the field-dependent and field-independent learners with respect to the type of skill being taught and the needs of the learner.

The existence of a significant positive correlation between learning style and proficiency level is an indication that the cognitive abilities associated to field-independence or high scores on the GEFT are perhaps being utilized to promote successful performances on verbal and aural communicative skills associated with the tests of proficiency level identification. This should assist the ESL teacher when preparing objectives and goals for the ESL program. It should also help the teacher to evaluate the expectations of both communicative competency and linguistic competency of each individual ESL student. Taylor (1975) and Larsen-Freeman (1978) agreed that learner strategies changed according to students' proficiency level. It is suggested that teaching materials and methodology in ESL should challenge the field-independent learner to use a variety of strategies in second language learning with
different materials available for different proficiency levels. This type of matching procedure explained by Lepke (1977) would not be difficult to incorporate into ESL classes since numbers in an ESL class are usually quite limited.

Although this study did not test for the matching of teacher learning styles, the previous research reviewed in this study has emphasized the importance of the teacher as a viable factor in learning outcomes (Blackman and Goldstein, 1982; Brophy, 1973; Ebmeire and Good, 1979; Kirchenbaum, 1969; McLeod and Adams, 1981; Mrosla, 1983; Parsons, 1980). Teacher education programs should emphasize the care that should be taken when teaching to a multicultural population in all subjects of school.

Learning a second language is different than learning a foreign language. So many more variables must be taken into consideration in second language learning including all aspects of exposure to a language and its culture, formal and informal settings, foreigner talk and teacher talk and the cognitive and affective variables of the individual. ESL students are not isolated in a classroom for learning a second language; culturally diverse students are participating in the learning process with every contact to the English language whether it is visual, kinesthetic, or verbal. It is difficult to measure that which is composed of so many variables.
This study has shown a significant positive correlation of time in an ESL program to reading achievement, but not to language achievement as measured by the CAT. Even though the language achievement score was greater than the reading achievement score for most of these students, the formal ESL education seem to show only a relationship to the reading achievement of these students. The various levels of language achievement appeared to be a result of other variables of environment, family and the individual. Exposure time to the culture and language should be considered more closely than limiting the time element to only the formal setting. These other variables discussed should be an integral part of any future studies of ESL students in relationship to achievement.

The instruments educators use to assess second language proficiency levels and cognitive learning style appear to be valid and reliable instruments for cross-linguistic students, but the use of the California Achievement Test administered by some districts for evaluating second language learning achievement in the English language is questionable. Although the CAT is a valid, reliable instrument for use with first language English speakers, its use with foreign students may be less reputable since the percentile scores are based on appropriate grade level and age. The language and reading subtests in particular do not deal with paragraph organization, semantics, connotation,
dialect, etymology or logic, all of which are aspects of learning a second language. The percentile scores do enable one to compare the progress of two students or groups of students over the same period of time, but a more comprehensive test to measure the achievement of ESL students in English should be constructed to conform to this cross-linguistic, cross-cultural purpose.

The variable of sex appears to make little difference in second language learning or cognitive learning style. Fairweather (1976) emphasized a difference on spatial tests similar to the GEFT in a cross-cultural study of highly stratified cultures of male dominance. Less structured societies showed little differences. Students in ESL in this study appear to have become bicultural at a faster rate than they have become bilingual. The sex difference seems to be of little or no consequence to research in second language learning.

Grade level, a compensatory labeling of age, had no significant correlation with achievement in ESL. The high achievement score and low GEFT score for the eighth grade subgroup and the high GEFT score and low achievement score for the ninth and tenth graders does suggest some questions concerning a relationship of second language learning development to the developmental stage theory and/or to brain growth/brain spurt research.


Mrosla, J. Differences between field-dependent and field-independent cognitive styles of low and high achieving mathematics students. An unpublished dissertation at North Texas State University, Denton, Texas, August, 1983.


CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purposes of this study were twofold. The first purpose was to determine if the sex, grade level, second language proficiency level or culture of the student's first language were significant variables in field-dependent or field-independent cognitive learning style. The second purpose was to determine if a student's achievement in a second language had a significant relationship to grade level, sex, time in an ESL program, second language proficiency level or cognitive learning style.

It was hypothesized that (1) there will be a significant positive correlation between field-independence and achievement in ESL, (2) there will be no significant difference in field-dependence between ESL students of the four selected cultures of Laotian, Spanish, Tongan, and Vietnamese, (3) there will be no significant difference in field-dependence between male and female students in ESL, (4) there will be no significant difference in the mean achievement scores between male and female ESL students, (5) there will be a significant positive correlation between second language proficiency level and second language
achievement, (6) there will be a significant positive correlation between field-independence and the higher grade levels of tenth, eleventh, and twelfth, (8) there will be a significant positive correlation between field-independence and second language proficiency levels of ESL students, and (9) there will be a significant positive correlation between achievement and the time in an ESL program.

Sixty-eight ESL students from four selected cultures participated in this study, twenty-five Laotian, thirteen Spanish, thirteen Tongan, and seventeen Vietnamese. Students were administered the language and reading portions of the CAT and either the LAS II or IPT II upon entrance into the school district. In the spring of 1985, they were administered the GEFT. The data were subjected to SAS statistical processes.

Pearson product-moment correlation coefficients, a multiple linear regression technique and a stepwise regression were used to test the data. A probability of .05 was established as the level of significance.

Findings

Results of the correlation coefficients indicated that there was a significant positive correlation between field-independence and achievement on the language subtest of the CAT but not the reading subtest. The field-dependent learner exceeded in reading achievement but not to a
significant degree, while field-independent learners had a tendency to excel in language skill achievement as measured by the CAT. This characteristic of different learning styles affecting different areas of learning supports Hansen and Stansfield's (1980) hypothesis that the cognitive and social/psychological traits characterizing either style preference seemed implicated in the development of an integrated language proficiency. It does confirm that the cognitive style variable influences second language learning as measured by different instruments including second language skills measured by the LAS II, IPT II, and CAT language subtest.

In addition to this relationship, the study also revealed a significant positive correlation between achievement on the reading subtest of the CAT and the time spent in an ESL program, while no significant correlation was expressed between time in an ESL program and the language portion of the CAT. This substantiates somewhat that exposure to a language does affect the extent of the learning of that language in relationship to certain skills. Schumann (1980) expressed a similar relationship to the learning and use of relative clauses in spoken language.

Results indicated that neither sex nor culture was a significant variable in the identification of cognitive learning styles of field-independence or field-dependence.
The data indicated no significant difference in the mean achievement scores between male and female ESL students.

As reliability and validity research of the LAS II (Duncan, 1983) and IPT II (Dalton, 1983) tests has indicated there is a significant positive correlation between second language learning achievement and second language proficiency level. This study confirmed the reliability and validity related to these two instruments in evaluating appropriate proficiency levels of ESL students. It substantiates the statistically significant positive correlation between achievement in second language reading and general language skills to proficiency level of a verbal and aural nature. Results of this study also established a significant positive correlation between field-independence and the proficiency levels of second language learners from four selected cultures.

Previous research (Snow, 1983) had indicated that older subjects are better in second language learning when the subjects are evaluated within the first two years of exposure. Cummins (1979) suggested that older learners may acquire cognitive-academic second language skills more rapidly than younger learners because of their more advanced cognitive development. It was inferred that older teenagers may have moved into a formal-operational stage of development and, therefore, would function better at restructuring abilities required in second language
learning. This was not true in this study of ESL students. Although the correlation between grade level and achievement was a negative correlation, revealing that second language achievement scores increased as the grade level decreased, it was not statistically significant at $p < .05$. There was also no statistically significant correlation between grade level and cognitive learning style.

Conclusions

Based upon the findings of this study, the following conclusions appear to be warranted.

1. There is a significant positive correlation between field-independence and achievement scores of the CAT language subtest.

2. There is no significant difference in field-dependence between ESL students of the four cultures, Laotian, Spanish, Tongan, and Vietnamese.

3. There is no significant difference in field-dependence between male and female ESL students.

4. There is no significant difference in the mean achievement scores between male and female ESL students.

5. There is a significant positive correlation between second language proficiency level and second
language achievement scores on both CAT reading and CAT language subtests.

6. There is no significant correlation between field-independence and grade level of ESL students.

7. There is no significant correlation between grade level and achievement scores of CAT for ESL students.

8. There is a significant positive correlation between field-independence and second language proficiency level of ESL students.

9. There is a significant positive correlation between time in an ESL program and achievement scores of the CAT reading subtest.

Recommendations for Future Study

This study was limited to determining the interaction of field-dependent-independent cognitive learning style and achievement of ESL students from four selected cultures. On the basis of the findings and conclusions of this study, it is recommended that the following types of studies be made:

1. To determine the interaction of affective variables of learning styles and achievement of ESL students;

2. To determine the interaction of field-dependent-independent cognitive learning style and achievement of ESL students statewide;
3. To develop a test other than a proficiency test to measure achievement in English especially designed to incorporate aspects of second language teaching;

4. To determine the correlation between certain teaching methods and materials and achievement of ESL students;

5. To determine the correlation between the developmental stage theory and second language learning;

6. To determine the correlation between brain growth and/or brain spurt research and second language learning;

7. To determine the correlation between cognitive learning style and achievement of second language learners in other academic subjects.
CHAPTER BIBLIOGRAPHY

Cummins, J. Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. Working Papers on Bilingualism, 1979, 19, 198-205.


Duncan, S. E. and De Avila, E. A. A convergent approach to oral language assessment, theoretical and technical specifications on the language assessment scales, LAS form A. San Rafael, California: Linguametrics Group, 1983.


BIBLIOGRAPHY

Books


Articles


Anderson, R. W. The impoverished state of cross-sectional morpheme acquisition/accuracy methodology (or: The leftovers are more nourishing than the main course). Working Papers on Bilingualism, 1976, 4, 47-82.


Blumstein, S. and Cooper, W. Hemispheric processing of intonation contours. *Cortex, 1974, 10*, 146-158.


Cummins, J. Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. Working Papers on Bilingualism, 1979, 19, 198-205.


Mason, C. The relevance of intensive training in English as a foreign language for university students. Language Learning, 1971, 21, 197-204.


Nemser, W. Approximative systems of foreign language learners. IRAL, 1971, 9, 115-123.


Satterly, D. J. Cognitive styles, spatial ability and school achievement. *Journal of Educational Psychology*, 1976, 68, 36-42.


Reports

Bergum, J. E., and Bergum, B. O. Field dependence, perceptual instability, and sex differences. Paper presented at the Annual Convention of the Southeastern Psychological Association, Oklahoma City, Oklahoma, April 10-12, 1980.


Hansen, J., and Stansfield, C. Field-dependence and field-independence as a variable in second language cloze test performance. A paper presented at the International Conference of Teachers of English to Speakers of Other Languages (16th, Honolulu, Hawaii, May 1, 1982).


Hartnett, D. The relation of cognitive style and hemispheric preference to deductive and inductive second language learning. Paper presented at the Neurosciences meeting, Brain Research Institute, UCLA, September 27, 1974.

Hudson, T. B. The interaction of Piagetian stages of development in early adolescents, IQ levels and other variables in predicting success on a grammar task. A research report from Ohio, 1981.

Jenkins, J. Learning styles: a pivotal point for retention and career decision guidance. A paper presented to the Annual Meeting of the National Academic Advisors Association (Indianapolis, Indiana, October 1981).


Peterson, P., and Janicki, T. Individual characteristics and children's learning in large-group and small-group approaches. A report from the Project on Studies of Instructional Programming for the Individual Students at Wisconsin University, Madison, Wisconsin, April, 1979.


Newspapers

Olson, L. Bilingual students are underserved, E. D. report says. Education Week, 1984, 4, 1-11.

Unpublished Materials


Mrosla, J. Differences between field-dependent and field-independent cognitive styles of low and high achieving mathematics students. An unpublished dissertation at North Texas State University, Denton, Texas, August, 1983.


