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## The Relationship Between Bilingualism And Non-Verbal Creative Behavior Among Limited-English Proficient And Spanish-English Proficient Hispanic Girls Of Primary School Age (Cognitive Flexibility, Mexican)

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THE RELATIONSHIP BETWEEN BILINGUALISM AND NON-VERBAL  
CREATIVE BEHAVIOR AMONG LIMITED-ENGLISH PROFICIENT  
AND SPANISH-ENGLISH PROFICIENT HISPANIC GIRLS  
OF PRIMARY SCHOOL AGE

A Dissertation  
Presented to  
the Faculty of the Graduate School  
UNIVERSITY OF THE PACIFIC

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In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

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by  
Pablo Andres Alvarez  
September 1983



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This dissertation, written and submitted by

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Dated September 30, 1983

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The Relationship Between Bilingualism and Non-Verbal Creative Behavior Among Limited-English Proficient and Spanish-English Proficient Hispanic Girls of Primary School Age

Abstract

This study investigated and compared the non-verbal creative behavior of Spanish-English Proficient (SEP) and Limited-English Proficient (LEP) girls as measured by the figural form of the Torrance Test of Creative Thinking (TTCT); and examined the relationships of non-verbal creative thinking and selected home environment variables, as measured by the Index of Home Educational Environment (IEE).

A sample of 31 LEP and 30 SEP students was selected from a total population of 140 girls. The selection of the sample was done in two stages. Girls who did not score within one standard deviation of the mean for each age group on the Developmental Test of Visual Motor Integration, were eliminated. The student's linguistic grouping was refined by using the Toronto Tests of Receptive Vocabulary (English/Spanish).

Stage two, involved the individual administration of the Bicultural Test of Non-Verbal Reasoning, and the administration of the TTCT, Figural Form A. Students who did not score within the average in non-verbal reasoning ability were eliminated from the study.

Causal-comparative design was used in this study. The level of significance for rejecting the null hypotheses was set at .05. Statistical techniques used in this study were the one-way ANOVA, two-way ANOVA, and the Pearson product-moment correlation.

Statistical analysis indicated that neither the main effect of language group nor the interaction effect of home environment were generally significant. There was positive association between figural elaboration and two IEE variables for the SEP group, and figural fluency and five IEE variables for the LEP group.

A clear pattern of higher SEP mean scores emerged from this study. This suggested (a) that bilingualism does not have a detrimental effect on non-verbal creativity, and (b) that the superior performance of the SEP group may begin to emerge at the elementary age level.

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## Chapter 1

### Introduction to the Study

Spanish language persons are already the largest group of non-English language background persons in the United States, and their share of the limited-English-proficient (LEP) school age population is expected to increase. It has been estimated that the total number of LEP children ages 5-14 was 2.5 million in 1976, dropped to 2.4 million in 1980, and then will climb to 3.4 million in the year 2000. In addition, the Spanish group is projected to grow faster than any other LEP group (Oxford, Pol, Lopez, Strupp, Gendell, and Peng, 1981). Thus, the importance of bilingualism for educational planning is clearly significant as many more bilingual children will be enrolled in public schools during the next two decades.

Old issues about the relationship between bilingualism and achievement and the problem of cultural integration are being reactivated by the presence of an increasing number of these students in our schools. Is bilingualism a negative force in children's development? Should native language acquisition be disregarded in favor of English as the language of instruction? Does bilingualism confuse children's thinking processes, and ultimately, does bilingualism prevent children from becoming "good Americans"?

By answering affirmatively all these questions, investigators in the early part of this century not only generated the myth of bilingualism as a handicap, but also provided the ideological context, focus, and direction of subsequent research. The residual effects of this ideology have persisted to the present time. The proposition that bilingual children do poorly in school because of the school's treatment of them was not considered until recently (Cummins, 1981). A review of previous psychopedagogical research on bilingualism demonstrated that studies which showed that bilingualism has a detrimental effect on intellectual functioning did not take into consideration important variables, such as age, sex, socio-economic class, and degree of bilingualism of their subjects (Carringer, 1974). A comprehensive survey of the literature indicated that studies showing a favorable effect of bilingualism on measured intelligence were in the minority, and that these studies also suffered from significant methodological flaws (Darcy, 1953).

Inasmuch as bilinguals may suffer from linguistic interference, Peal and Lambert (1962) hypothesized that they might perform slightly worse on verbal intelligence tests but should not differ from monolinguals on non-verbal measures. However, the results of their study indicated that, contrary to expectations, bilinguals had higher verbal and non-verbal

scores than monolinguals. Bilinguals generally did perform better on non-verbal tests which appeared to depend on concept formation or what the authors called "symbolic flexibility" (Peal & Lambert, 1962). It should be noted that Peal and Lambert's findings are consistent with Darcy's (1953) review. Her analysis of prior research demonstrated that there was no indication of the inferiority of bilingual subjects when their performance on non-language tests of intelligence was investigated.

Finally, an analysis of current theories of communicative competence demonstrated the significant limitations of many studies of bilingualism. Such studies either exist in a vacuum or else have been proposed in a very different context from that of bilingual education in the United States (Cummins, 1981).

A timely concern, then, would be to conduct studies which take into consideration the important variables described above and investigate the relationship between bilingualism and cognitive functions, especially developmental factors and other abilities such as creative behavior. The present investigation examined possible differences in cognitive functioning between Spanish-English-proficient (SEP) and limited English proficient (LEP) females of Hispanic descent against a criterion of non-verbal, figural creative behavior as measured by the Torrance Test of

Creative Thinking, (TTCT), Figural Form A.

The Problem

Some previous studies have shown a positive relationship between bilingualism and the verbal and non-verbal areas of cognitive functioning. Studies of bilingualism among Hispanic-Americans, however, are sparse. Furthermore, if the search focuses exclusively on studies of non-verbal creative behavior among this population, their scarcity soon becomes apparent.

Would the positive effect of bilingualism manifest itself among younger Hispanic-American girls? Furthermore, when the perceptual organization and reorganization of visual stimuli which are prerequisite functions to figural creativity behavior are taken into consideration, will the "symbolic flexibility" emerge in this area which assumingly does not depend on verbal strategies? Is the "symbolic flexibility" effect previously investigated (Peal & Lambert, 1962) generalized to other cognitive functions?

This study compared the performance of Spanish-English-proficient and Limited-English-proficient female students on a measure of figural creativity. The SEP and LEP groups consisted of females, ages five to ten. These two groups were matched by age and had performed within average norms on tests of visual-motor perceptual integration development



and non-verbal reasoning ability.

A secondary purpose of this study was to examine the effects of home environment process variables on the development of non-verbal figural creative thinking in the two groups of students.

### Purpose and Significance of the Study

#### Purpose of the Study

It was the purpose of this study (a) to investigate and compare the non-verbal figural creative behavior of SEP and LEP children as measured by the figural form of the TTCT; and (b) to examine the relationships of figural creative thinking and selected home environment variables, as measured by the Index of Home Educational Environment (IEE).

#### Significance of the Study

A significant difference in the performance of bilinguals and the monolingual groups on a measure of non-verbal figural creativity could have important implications for education in general and bilingual education in particular. Bilingualism, insofar as it provides a wider range of cultural experience may affect intellectual development by enhancing mental flexibility, facilitating a more diversified set of mental abilities, improving concept formation and finally leading to superior school achievement (see Peal &

Lambert, 1962). This improvement in cognitive development, may indicate the importance of second language training.

In addition to the instrumental and integrative benefits to majority students, this practice will establish the value of the minority languages in the minds of minority students. This would significantly contribute to the fulfillment of the student's need to experience positive psychosocial adjustments to life in a complex, multicultural society. In turn, this may suggest the importance of the development of bilingual-bicultural education along pluralistic lines of educational planning.

Schooling in the United States needs to address the rapid obsolescence of information and promote adaptive strategies needed to deal productively with change. The "symbolic flexibility" which may be promoted by bilingualism is a significant prerequisite to problem-solving activities in general. If one of the long-term goals of education is to prepare children to take their places in our rapidly changing society, then we will need open, flexible minds with the ability to access and combine information in new ways. In a time of radical technological change, when a priori assumptions may no longer be viable, the ability to generate new paradigms is in great demand.

#### Research Methodology

The present investigation was concerned with the degree

of figural creativity found in two groups of students; consequently, the causal-comparative research methodology was used. The causal-comparative method attempts to discover the possible causes for a behavior pattern by comparing subjects in whom this pattern is present with similar subjects in whom it is absent or present to a lesser degree (Borg & Gall, 1979).

The causal-comparative method is often used to test hypotheses about cause-and-effect relationships in situations which do not permit experimental manipulation. As Sax (1968) stated, the causal-comparative method is experimental because an attempt is made to infer causal relationships; it is, however, also descriptive in the sense that the investigator has no direct control of experimental conditions.

Kerlinger (1964) defines the causal-comparative method as a design in which the independent variable(s) have already occurred and in which the investigator starts with the observation of the dependent variable; then he examines the independent variable(s) in retrospect for their possible relations to and effects on the dependent variable(s). These variables are factors already present in the population under study. It is the researcher's responsibility to determine which variables exert the greatest impact upon a particular factor being investigated and whether there is a causal relationship among them.

Interpretations of causal-comparative findings are limited because the researcher does not know whether a particular variable is a cause or a result of the behavior pattern being studied (Borg & Gall, 1978). In this study, one cannot say definitely what is the causal relationship between bilingualism and figural creative behavior; did being bilingual cause one group to respond in a particular way, or did some other variable cause it to respond differently from the other group? Kerlinger (1964) stated that this method has three major weaknesses: a) the inability to manipulate independent variables, b) the lack of power to fully randomize; and c) the lack of thorough control, hence the risk of improper interpretation. Despite these problems of interpretation, the method is useful for identifying possible causes of observed variations in behavior patterns. The causal-comparative approach may yield more results in less time (Borg & Gall, 1978). Kerlinger (1964) also pointed out some of the values of this design by saying that many important variables in educational research are not manipulable, such as intellectual ability, aptitude, home background, parental upbringing, socioeconomic background, creative ability, and bilingualism, to name some. The causal-comparative research design has been chosen as the appropriate method of psychological research for this study because the dependent variable, figural creative behavior, is

one which does exist in all people, thus deserving investigation.

The present research was conducted in Tracy, California. The determination of English-Spanish bilingualism and Spanish monolingualism was based on the students' scores on the Toronto Test of Receptive Vocabulary (English/Spanish) developed by Allen S. Toronto (1977). The Bicultural Test of Non-Verbal Reasoning, also developed by Allen S. Toronto (1977), was used to identify female students of average non-verbal intelligence. The Developmental Test of Visual Motor Integration (Beery, 1967), was utilized to reject subjects with problems in visual-motor integration. Finally, non-verbal figural creative behavior was measured by the Torrance Test of Creative Thinking, Figural Form A (Torrance, 1974), and the Index of Home Educational Environment (Dave, 1963) was adopted to provide a measure of the educational environment in the home.

### Assumptions and Limitations

#### Assumptions

1. Creative abilities are possessed by everyone to some degree.
2. Creative thinking abilities are independent of intelligence.

3. Figural creative behavior does not depend on verbal concept development.
4. Utilization of aides reduced the experimenter's bias effect.
5. Systematic individual and small group instruction of the participating aides, by the researcher, resulted in proper testing administration procedures.
6. Individual and small group assessment procedures, during regular school hours in their home schools, by familiar aides, enhanced adequate rapport and student cooperation.

#### Limitations

1. Only female students five to ten years old will be included in this study.
2. The sample for this study is drawn from one school district.
3. Only one linguistic group will be studied (i.e., native Spanish speakers).
4. Generalization of results will be restricted to the Tracy area, unless comparable demographical data with other cities suggests differently.
5. The performance measures employed in the assessment of bilingual proficiency are potentially affected by non-linguistic, extraneous factors that vary differentially in the two languages, such as greater

social prestige for one language than for another (Carringer, 1972).

6. In this study, degree of bilingualism does not adequately distinguish the phonological, grammatical, graphic, lexical and semantic aspects of the two languages or the individual's command of these aspects in speaking, listening, reading, or writing. Although it is recognized that there is a great deal of interdependency in these skills, they may differ markedly (Carringer, 1972).

#### Definition of Terms Used

The following definitions of terms have been used throughout this study:

1. Cognitive Process: Intellectual, language and perceptual development. The process of learning.
2. Creative Thinking: A behavior measured by the TTCT, Figural Form A. Torrance defined creativity as a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses and possibly modifying and retesting them; and finally communicating the results (Torrance, 1974).
3. Figural Fluency: A score which reflects the test taker's ability to generate a large number of ideas

figurally.

4. Figural Flexibility: A score which represents the test taker's ability to produce a variety of ideas figurally which may be classified into qualitatively different categories, to shift from one approach to another or employ different strategies.

5. Figural Originality: A score which indicates the test taker's ability to produce ideas, represented figurally, which differ from the normatively dominant response to the test stimulus, and novel responses displaying imagination and divergence from the commonplace.

6. Figural Elaboration: A score which demonstrates the test taker's ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas.

7. Figural Creativity: The behavior measured by the TTCT, Figural Form A.

8. LEP: A limited-English-proficient child is one who obtained an average score in Spanish receptive vocabulary and a below-average score in English receptive vocabulary, as defined by the tests of receptive vocabulary. (See Assessment of Bilingualism in Chapter 3.)

9. Non-verbal Creativity: A behavior measured by the TTCT, Figural Form A.

10. SEP: A Spanish-English-proficient child is one who obtained average scores in both Spanish and English receptive vocabulary as defined by the tests of receptive vocabulary.



(See Assessment of Bilingualism in Chapter 3.)

11. Environmental Process Variables: 1) Achievement Press, 2) Language Models, 3) Academic Guidance, 4) Activeness of the Family, 5) Intellectuality in the Home, and 6) Work Habits in the Family, as measured by Dave's (1963) rating scales.

Achievement Press: Pertained to the role of the family in motivating the child toward learning, and expecting certain standards of achievement.

Language Models: Language models to which the child is exposed in the home. Particular attention was placed on the quality of the language used by the parents, opportunity for the enlargement of vocabulary, and keenness of the parents for correct and effective language use.

Academic Guidance: Referred to the parent's awareness regarding the educational progress of the child, their willingness to help her appraise her own strengths and weaknesses, and the provision of opportunities for the development of a sense of accomplishment.

Activeness of the Family: Focused on the variety of indoor and outdoor experiences, and the nature and quality of family activities.

Intellectuality in the Home: Assessed the presence of thought-provoking situations presented to the child by the home environment through toys, games, hobbies, appliances, and other similar type of activities.

Work Habits in the Family: Estimated the general work habits of the family, the values and priorities attached to different routines, and the degree of structure in the management of the home.

11. Index of Home Educational Environment (IEE): A single indicator of the educational environment in the home (Dave, 1963).

### Research Hypotheses

The statement of the problem presented earlier in this chapter is now reformulated in the form of specific research hypotheses tested in this study.

H<sub>1</sub>: Female SEP students will score higher than female LEP students in figural creativity, as measured by the TTCT.

H<sub>2</sub>: Female students with a high index of home educational environment (IEE) will score higher than those with low IEE scores in figural creativity.

H<sub>3</sub>: There will be an interaction between language (SEP and LEP) and the six process variables on the test of figural creativity.

H<sub>4</sub>: There will be a relationship between each subtest of the TTCT, and the six process variables of the IEE for the female LEP group.

H<sub>5</sub>: There will be a relationship between each subtest of the TTCT and the six process variables of the IEE for the SEP

group.

### Summary

This chapter presents an introductory statement to the study, states the problem, specifies the significance of the research, outlines the assumptions and limitations of the investigation, and defines those terms deemed important to the hypotheses developed. Four additional chapters are included in the study. Chapter 2 reviews the literature related to this study. This chapter surveys the concept of bilingualism, the impact of bilingualism on cognitive development, the relationship between bilingualism and creative thinking and the relationship between home environment variables, bilingualism, and creativity.

Chapter 3 describes the population and sample of the study, the selection of the SEP and LEP groups, and technical characteristics of the instruments, the research methodology of the study, and the statistical analysis employed. Chapter 4 describes the findings of the study regarding the degree of creativity in the two groups of students. This chapter also describes the relationship between creativity and home environment variables in the two sub-groups. Chapter 5 contains the conclusions of the investigation and recommendations for further study.

## Chapter 2

### Review of the Literature

This chapter reviews the literature related to this study. Seven main themes are discussed: (a) major trends in research, (b) bilingualism and intelligence, (c) bilingualism and creativity, (d) tests of creative thinking, (e) assessment of bilingualism, (f) environmental factors, and (g) neurolinguistic research.

#### Major Trends

There are two major trends in the research on the effects of bilingualism on cognitive functioning which emerge from this review of the literature. One trend views bilingualism as a negative condition which creates the need for language switching, both to process and express information. The result of these language subprocesses in bilinguals is an effective block of cognitive performance (Weinreich, 1953). Authors who accept this view have argued that mental confusion results from bilingualism. A critique of the research on which this view is founded has pointed out that the studies often lacked adequate controls for such important variables as age and socioeconomic factors, contained inadequate assessment of bilingualism, and utilized translated tests which have not been standardized in the culture under study (Peal & Lambert, 1962).

The second trend proposes a different view of the child. The bilingual child is presented as being exposed not only to the discrepant experiences common to all human development, but also to those discrepancies inherent in the dual linguistic environment. Since the child must adapt to two languages, a cognitive conflict ensues which triggers the accommodation subprocesses; the cognitive structures necessary for the assimilation of new information are thus maximized in the bilingual child, and cognitive development is correspondingly enhanced. Following this rationale, Ben Zeev (1972) provided evidence that bilinguals were more advanced than monolinguals in terms of perceptual organization and reorganization of verbal auditory material, and also demonstrated greater flexibility and ability to provide explanations of what constitutes a correct solution. From this perspective, bilingualism allows the person to dissociate the essential idea behind a thought from the particular form it assumes when verbalized (Vygotsky, 1962).

A comprehensive review of earlier research (Jensen, 1962) found equal support for and against bilingualism as it affects speech and language development, intellectual development, emotional stability, achievement, and society as a whole. The author demonstrated that differing definitions of bilingualism, significant variability in the selection of subjects, differences in the number of people studied,

limited methods of investigation, and arbitrary approaches to the study of this phenomenon imposed by the various specialists may have accounted for the conflicting findings of these studies.

### Bilingualism and Intelligence

A major study where important variables were matched among French and English-speaking students in Canada (Peal & Lambert, 1962) found that bilingual children performed significantly better than monolinguals on tests of verbal and non-verbal intelligence. It is important to note that this finding was contrary to the expectations of the researchers. The authors summarized their interpretation of the results by stating that bilingualism provides access to a wider range of experience in two cultures, and that this experience affects the child's intellectual development in several ways, producing enhanced mental flexibility, superior concept formation, a more diversified set of mental abilities, and superior school achievement (see Peal & Lambert, 1962). This study also raised some very important questions about the investigation of bilingualism. Among these issues were potential differences in the performance of bilinguals and monolinguals in areas other than intelligence and questions associated with the interaction of human developmental factors.

### Bilingualism and Creativity

Evidence supporting or denying a relationship between creative thinking abilities and bilingualism is scarce. The first empirical study, conducted by Jacobs and Pierce (1965), compared Czech-English, Greek-English, and Spanish-English bilingual sixth-graders on a word meaning and a word usage test of creativity or "divergent thinking." All subjects attended public schools in Florida. Bilinguals scored significantly higher on the non-verbal word usage test and on the combined score, but monolinguals scored significantly higher on the verbal word meaning test. However, the seventeen Spanish-American bilinguals in the study scored significantly lower than the English monolinguals, the Czech-American bilinguals, and the Greek-American bilinguals. The lower scores of the Spanish-American bilinguals could have resulted from their lower socioeconomic status.

Torrance, Gowan, Wu and Aliotti (1970) investigated the creative thinking abilities of children in Singapore. A total of 1,063 monolinguals and bilingual Chinese and Malayan children in the third, fourth, and fifth grades were administered the Figural Form A of the Torrance Tests of Creative Thinking. The overall results showed that the monolinguals excelled over the bilinguals in fluency and flexibility ( $p < .01$ ), but that the direction of the trend was reversed for originality and elaboration. The overall difference for

elaboration was significant at the .05 level. The explanation given for the results on the elaboration subscale was the tendency of children to "fill in the gaps" in the face of conflict and uncertainty by elaboration or "making things fancy." The overall difference in originality was not significant, but when corrections were made for the number of responses, the trend toward the superiority of the bilinguals over the monolinguals on both originality and elaboration became stronger. The explanation given by Torrance for the superiority of monolinguals over bilinguals in fluency and flexibility was that negative transfer or interference from the competition of old and new responses resulted in forgetting, thus reducing the speedy production of ideational associations required in the figural tasks of the Torrance Tests of Creative Thinking.

The effect of bilingualism on creativity was studied from a different perspective by Landry (1974). He examined the effects of second language instruction on the divergent thinking skills of elementary school children. A significant development of these skills as a result of language training was demonstrated when data was analyzed across sex.

A comparative study of creative thinking abilities among bilingual and monolingual Mexican-American fourteen to sixteen-year-olds (Carringer, 1972) was consistent with the findings of Peal and Lambert and lent further evidence to the



superiority of bilinguals on measures of verbal flexibility, verbal originality, figural originality, and figural fluency. No significant differences in verbal fluency and figural flexibility were reported, although bilinguals scored higher (Carringer, 1972).

#### Assessment of Bilingualism

Issues about the proper assessment of both bilingualism and monolingualism as crucial variables in these studies have been continuously raised in the literature (Peal & Lambert, 1962; Jensen, 1962; Darcy, 1953; Carringer, 1972). Cummins (1976) has recently presented a dual threshold model of bilingual proficiency. Cummins proposes that the attainment of a lower level of bilingual proficiency would be sufficient to avoid any negative cognitive effect of bilingualism, but that the attainment of a second, higher level of bilingual proficiency may be necessary to accelerate cognitive development. Although more studies are needed to substantiate this hypothesis, it has become increasingly clear that all research in this area is highly dependent on the objective determination of both monolingualism and bilingualism.

It is also important to consider the ways in which bilingualism may affect non-verbal performance. Peal and Lambert's results (1962) indicate that bilinguals and monolinguals perform similarly on those non-verbal tests which

require spacial and perceptual processes, such as the Primary Mental Abilities, Space, Perception and Number, but that bilinguals perform significantly better on non-verbal tests involving "concept formation" or symbolic flexibility, such as Primary Mental Abilities Figure Grouping and Raven Progressive Matrices.

The theoretical rationale for the hypothesis that bilinguals have superior ability in cognitive reorganization or flexibility is that the child learns to separate the sound from the thing itself. Therefore, the bilingual is more concerned with meaning than symbol.

This point of view is consistent with Piaget's suggestion that the more an infant has seen and heard, the more he later wants to see and hear (Hunt, 1961). The more varied experience which a child has had results in his developing a set to seek out new experiences. Thus, alternating from one language to another may develop a set for flexibility in thinking.

Skill with two languages also affects the concepts used for problem solving. A concept in one language may be richer, have more varied meanings, than the same concept in a second language. For example, the Spanish word "fresco," which means "cool" or "fresh," does not have the variety of nuances which the English word "cool" has. Conversely, the Spanish phrase "más or menos," has more varied meanings than its

English counterpart, "more or less" (Carringer, 1972, p. 17).

### Environmental Factors

The idea that the home and the neighborhood environment has a strong influence on educational achievement has also been a topic of research which may have important implications for the study of SEP and LEP populations. Wells (1979), reporting on linguistic development studies conducted in England, stated that although variations in the rate of language development were found, no significant association with class of family background was reported. He does indicate, however, that one of the most important dimensions of variation, both at home and at school, is the quality of adult-child interaction that the child experiences.

Although time spent in school may be crucial for those who are least exposed to educational resources in their neighborhoods and at home, there is general agreement among some researchers, that school resources and their impact do not interact with achievement as compared to family background (Coleman, et al., 1966; Hodgson, 1975). Students seem to make more academic progress when their parents are directly involved with their learning and instruction.

A group of educators (Edmonds, Billingsley, Comer, Dyer, Hall, Hill, McGhee, Reddick, Taylor, & Wright, 1973), retort to these critiques focused on three major issues. First,

many poor children are not motivated toward school because they have learned little in relation to what should be taught and because school is primarily responsive to the affluent. Second, educators still do not recognize differences in cognitive styles and do not plan different ways of teaching the requisite skills to all children. Third, the compensatory interventions analyzed by the research (Jenks, 1978) deny cultural pluralism. Finally, they concluded that the problem appeared to be one for which "more and better of the same" is not enough.

In this regard, it is important to note Dave's criticism of sociological research in education (1963). He characterized it as being general to the point of obscuring important differences among environments. He argued for the need for more specific and individual home environment profiles that would help us explore the uniqueness of the educational environment patterns of individual students.

These limited references to the influence of home and neighborhood environment are important to investigations exploring the differential performance of SEP and LEP students. Differential home educational environment profiles that could be compared to individual achievement profiles have a more useful instrumental value for educational planning than the more distant contributions of educational sociology.

### Neurolinguistic Research

Mention should also be made of recent contributions to the study of bilingualism by neurolinguistic research. Some neurolinguistic evidence indicates that those who receive their second language instruction early have an advantage over those who receive their second language instruction at a later time, because the brain mechanisms are viewed as not amenable to language introduction after the age of ten (Penfield, 1959). Penfield argues for the existence of a biological timetable of language learning. He indicates that the complex speech-mechanisms of the dominant hemisphere of the cerebral cortex develop in infancy and childhood before the onset of puberty. Penfield contends that we ought to use the plasticity of the brain in the early years; for a young person it is no more difficult to learn two or three languages than it is to learn one. Penfield contends that the child's brain has much plasticity up to about the age of ten. A child's brain has a specialized capacity to learn, a capacity which decreases with the passage of years. He argues that there is a biological clock which regulates the development of the brain as well as the glandular development of children. He also believes that the language mechanism of the human brain is the same, whether one, two, or more languages are learned.

Penfield's views are based primarily on studies of brain damaged individuals at different states of life. A child who

has lost the use of one hemisphere and has become aphasic can relearn language, whereas adults do not have this capacity. It is important to note that other researchers claim that even within childhood, recuperation of language is age-related (Krashen, 1981).

Penfield's theory is consistent with the work of Hebb (1949) in neurology which demonstrated connections between the growth of brain mechanisms and the development of verbal behavior. The work of Lenneberg (1967) also suggests that neurophysiological structures within the child are optimal for learning a language at about the age of two. He contends that children begin speaking not because of any environmental change, but as a result of a maturation schedule specific to language (Lenneberg, 1962).

Other neurolinguistic studies oppose the view of Penfield. Milner (1960) argues that Penfield's conclusions are not warranted by experimental data. Levy's (1983) review of right and left hemispheric functioning indicates that, in studies of split-brain patients, although speech is almost entirely confined to the left hemisphere in the majority of the right-handed subjects, there is some evidence that the right hemisphere may occasionally be able to generate spoken words, particularly if these are stimulated by strong emotion.

Other aspects of language, Levy (1983) points out, are

not nearly so symmetrically organized as speech. The isolated right hemisphere of split-brain patients understands a great deal of what is said, can read simple words and can reach a comprehension vocabulary equivalent to that of a twelve-year-old person. The mechanisms of comprehension of split-brain patients, however, almost certainly differ from normal individuals, as judged by their low level of comprehension of syntax and grammar, and their inability to follow complex verbal instructions if these place a burden on short-term verbal memory.

Tachistoscopic investigations of brain asymmetry reveal that, although the left hemisphere controls processing of verbs, abstract nouns and adjectives, both hemispheres are equally competent in processing concrete nouns and adjectives (Levy, 1983). These findings suggest that when word meanings are susceptible to image or representation, there is little difference between the two sides of the brain. The rich and full meaning of words, then, is derived from an intimate, collaborative integration of the processes of both hemispheres. Further evidence of the role of the right hemisphere in structuring meaning comes from studies of patients with right hemisphere damage. When these subjects are asked to provide a synopsis of stories read to them, they selectively omit emotional and humorous content (Levy, 1983). Apparently, the left hemisphere memory structure for verbally

presented material is incomplete, and the attentional system is biased to respond to only a subset of the information presented. Right hemispheric processes are very important for the apprehension of full meaning from oral or written communications and for its expression. Levy's review concludes that both hemispheres contribute important and critical processing operations to the various aspects of language. The final level of understanding or output cannot be allocated to one hemisphere or the other.

Language lateralization in bilinguals and monolinguals is another topic of neurolinguistic research which may have important implications for the study of bilingualism. Language may be organized in the brain of the bilingual in a manner different from that which might be predicted by studies of cerebral organization in monolinguals. The right hemisphere seems to play a more significant role in the acquisition of a second language, suggesting different patterns of cerebral dominance for each language. Differential cerebral lateralization for each language is probably influenced by many different factors, including age, manner, and modality of second language acquisition. Albert and Obler (1978) argue that cerebral dominance of language in bilinguals is not a rigid, predetermined, easily predicted phenomenon, but rather that cerebral dominance is dynamic and subject to variation throughout life. It also appears



sensitive to environmental and especially to educational influences (Albert and Obler, 1978). Lenneberg's claim that lateralization is complete by puberty and responsible for the differences between children and adults in second language acquisition is disputed by some researchers. Krashen, (1981) disputes Lenneberg's claim in a recent review of the neurological correlates of second language acquisition. Krashen argues that there is considerable evidence today which suggests that much of the development of cerebral dominance may be complete much earlier than puberty. Krashen (1981) also points out that there are other possible explanations for the observed differences in second language learning ability. The onset of formal operations, with its associated cognitive and affective changes at puberty, could explain the differences noted between children and adults in the acquisition of a second language.

Krashen (1981) demonstrates that current research may be classified into three general categories: 1) lateralization by age zero, supported by electroencephalographic (EEG) measurements; anatomical; dichotic listening; and unimanual motor skills studies; 2) lateralization by age five, supported by brain damage and hemispherectomy research; and 3) lateralization by puberty as suggested by dichotic listening studies. Krashen proposes a developmental model to integrate this research data. He argues that persons are

born with a predisposition for left hemispheric language lateralization (lateralization by age zero), that the degree of lateralization continues to increase as demonstrated by the left hemispheric localization of some language functions in most right-handed people (lateralization by age five), and that some aspects of language competence are not lateralized until they are necessary for the perception of longer and more complex stimuli (lateralization by puberty).

These tentative findings from neurolinguistics are generally congruent with investigations demonstrating the better performance of bilinguals on tests of divergent thinking (Peal & Lambert, 1962; Carringer, 1974; Landry, 1974). However, the relevance of these neurolinguistic findings to the cognitive styles literature and associated curriculum applications (Lopez, 1980; Ramirez & Castañeda, 1975; Ramirez, 1973) is unclear and in need of substantial research at this time.

### Summary

The paucity of empirical evidence on the relationship of bilingualism to creativity demonstrates the need for further research in this area. Most of the early research on bilingualism was methodologically deficient, and interpretation of the results of these studies was influenced by the prevailing mechanical view of human behavior, as well as the ideology of social and cultural assimilation (Cremin, 1961).

It is important to point out that the contemporary, more "positive" research on bilingualism first originated in Canada, and it was not until the sixties that the issue of bilingualism and creativity first emerged in U.S. research. If we take this analysis a step further and attempt to review studies of bilingualism and creativity among Spanish-Americans, the scarcity of information becomes immediately apparent.

The empirical and theoretical contributions of Piaget and the neurolinguistic research conducted by Penfield, Albert and Obler, and others indicate that children may be most amenable to second language learning at an early age, approximately four to ten. Learning a second language during this age span may produce subsequent cognitive benefits in bilingual children as they develop a "mental set" for flexibility in thinking (Peal & Lambert, 1962; Hunt, 1961; Ben Zeev, 1972).

The results of this review suggest the limited and, at times, contradictory nature of studies in the area of bilingualism and cognitive, creative, and neurolinguistic functioning. The purpose of this study was to (a) compare the non-verbal figural creative behavior of SEP and LEP children; and (b) to examine the relationship of creative thinking and selected home environment variables.

Weaknesses in past research were avoided by careful

selection of subjects of average intelligence and appropriate level of visual-motor integration development. A careful classification and selection of bilinguals and monolinguals was also an important component of this study.

Finally, by incorporating students from ages five to ten it was possible to explore age as a factor associated with differences in performance.

## Chapter 3

### Description of the Design and Procedures of the Study

The purpose of this study was to compare the non-verbal figural creative behavior of SEP and LEP children and to examine the relationship of creative thinking and home environment variables in each group separately. In this chapter the design and the procedures used in this investigation are described in detail.

Six main topics are discussed: (a) the population and sample of the study, (b) the selection of the SEP and LEP groups, (c) the data collection procedure, (d) the technical characteristics of the instruments, (e) the research methodology of the study, and (f) the statistical procedures employed.

#### Population and Sample of the Study

The target population of this research consisted of all SEP and LEP girls of Hispanic descent presently attending elementary schools in the United States. The accessible population consisted of all SEP and LEP elementary school girls in the Tracy Elementary School District at the time of this study. Sixty-one children, ages five through ten, served as subjects of this study. Thirty-one subjects were identified as Spanish-English proficient by a receptive

vocabulary test. Thirty were identified as limited-English proficient by the same instrument.

#### Selection of the SEP and LEP Groups

The director of the Bilingual education program in the Tracy elementary schools provided the investigator with a list of 140 names of girls attending five elementary schools who had been classified as either monolingual Spanish or bilingual English-Spanish on the basis of their scores on the Bilingual Syntax Measure (BSM).

The Director of Bilingual Education also provided the names of seven experienced bilingual and bicultural teacher's aides. These aides were trained by the investigator in the administration and scoring of all assessment procedures. They first administered the receptive vocabulary tests in English and Spanish to the entire group of 140 girls to determine the degree of bilingualism and monolingualism of each subject. Subsequently, they administered the test of visual-motor integration to assess visual-motor perceptual maturity.

After eliminating those subjects who did not score within one standard deviation of the mean for each age group on the visual-motor integration test and those who did not meet the selection criteria for bilingualism or monolingualism, as established for this study, seventy-eight subjects

were identified. Thirty-one students were classified as monolingual Spanish speakers and forty-seven as Spanish-English bilinguals.

The second stage in the selection of the sample involved the individual administration of the Bicultural Test of Non-verbal Reasoning and the small group administration of the test of figural creativity. During the administration of the tests, groups never exceeded five students at a time.

Elimination of students that did not score within the average range in non-verbal reasoning ability, and students leaving the Tracy area, further reduced the sample to thirty LEP and thirty-one SEP students. It was not possible to select additional students to compensate for the typical attrition involved in asking people to volunteer for a study, a significant reduction in LEP girls as a consequence of family immigration schedules, and because of the screening procedures established for this study. Increases in the rate of attrition were prevented by accelerating the data collection process. Table 1, illustrates the grade level distribution of students in each group and Tables 2 and 3 present the age distribution of students ultimately participating in this study. In order to explore age as a factor associated with differences in performance students were classified into a primary and intermediate cluster. Table 3, illustrates the number of students in the primary and the intermediate

cluster in each group.

Table 1  
Grade-level Distribution of Students  
in the Sample

Grade	Age	SEP	LEP	Total
K	5	5	7	12
1st	6	5	5	10
2nd	7	4	4	8
3rd	8	7	4	11
4th	9	6	7	13
5th	10	<u>4</u>	<u>3</u>	<u>7</u>
Total		31	30	61

Table 2  
Ages Distribution of SEP and LEP Children

Subjects	N	Mean Age	Range	SD
SEP	31	7.5	5	1.67
LEP	30	7.5	5	1.67



Table 3  
 Ages Distribution of SEP and LEP Children in  
 the Primary Cluster (K through 2nd Grade),  
 and in the Intermediate Cluster  
 (3rd through 5th Grade)

## Primary:

Subjects	N	Mean Age	Range	SD
SEP	14	6.2	2	1.76
LEP	16	5.8	2	1.87

## Intermediate:

Subjects	N	Mean Age	Range	SD
SEP	17	8.7	2	1.53
LEP	14	8.9	2	1.59

### Data Collection

To identify monolingual Spanish and Spanish-English bilinguals for this study, the Toronto Tests of Receptive Vocabulary (English/Spanish) developed by Allen S. Toronto (1977) were used. The English portion of the test was administered first and was immediately followed by the Spanish portion. Students were classified as monolingual Spanish (LEP) when their scores fell within the average range in Spanish and below the average range in English. Students were classified as Spanish-English bilingual (SEP) when their scores fell within the average range in both the Spanish and English tests. No subjects were included in this study, either LEP or SEP, who did not score within the average range on at least the Spanish scale.

Sixty-one students, thirty in the LEP and thirty-one in the SEP groups, were administered the Picture Construction, the Picture Completion, and the Lines subsection from Figural Form A of the Torrance Test of Creative Thinking (TTCT). The TTCT was scored by the investigator and a psychologist. All protocols were rescored to establish interscorer reliability. The results of these analyses are reported in Appendix D, page 150.

The last stage of data collection was the administration of an individual survey of educational home environment variables. This was carried out after school hours and

during weekends by the trained aides. The surveys were done by telephone, home visitations, or, in a very limited number of cases (N = 5) were mailed to the participating families. During this phase of the study some participants expressed reservations which prevented them from answering all questions in the survey. This survey was translated by the investigator with the assistance of six of the bilingual, bicultural aides. Translations were done so that they reflected the colloquialisms of the area whenever a literal translation would have been confusing or misleading to the respondent. (See Figure Chart 1: Procedures, page 40.)

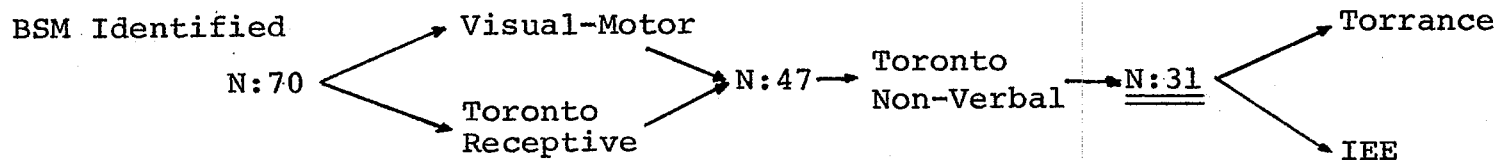
### Instrumentation

#### Toronto Tests of Receptive Vocabulary

The Toronto Tests of Receptive Vocabulary (English/Spanish) were developed by Allen S. Toronto (1977). In responding to items on tests, the individual must point to one of three pictures which goes with an aurally presented word. The English portion of the test was administered first and was immediately followed by the Spanish portion.

Toronto (1977) reported that a total of 1,276 students were included in the standardization process for this instrument. Children were evenly distributed within each age level by three-month intervals to create a true continuum of age. Subjects were chosen at random from various schools in San

SEP Group



LEP Group

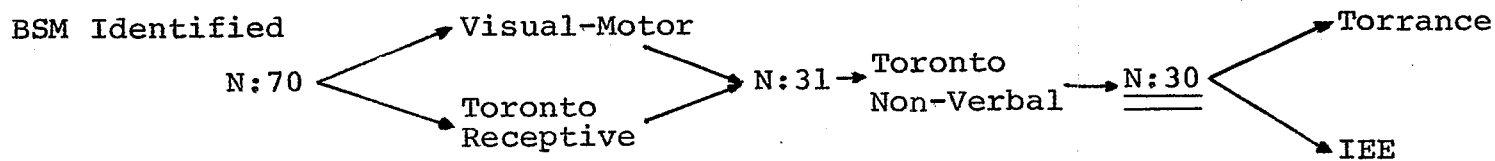


Figure Chart 1: Sampling Procedures

Antonio, San Marcos and Temple, Texas. Children with diagnosed learning disorders were not included in the sample. Children were tested in Spanish if they spoke Spanish at home at least 75 percent of the time. In no instance was a child tested in both English and Spanish and included in the standardization sample twice. Age level norms for the tests were developed for Anglo-American children, English-speaking Mexican-American children, and Spanish-speaking Mexican-American children. The norms are presented in the form of percentile ranks.

Bilingual comprehension can be measured by giving both the English and the Spanish versions of these tests and by comparing the relative strength of each language using the appropriate norms. Toronto (1977) did not find statistically significant differences between the seven and eight-year-old English-speaking Mexican-American children, nor were there differences between the eight and ten-year-old Spanish-speaking Mexican-American children. This finding indicates that the Spanish version of the test is adequate for age discrimination only between the ages of four and eight years of age. Also, the English version does not discriminate well at the seven and eight-year-old levels for English-speaking Mexican-American children.

A total of 152 children were retested with the same instrument by a different examiner within one month of the

first testing. At least two weeks were allowed to pass after initial testing before re-testing was completed. The Pearson product-moment correlations for these repeated measures were: English-speaking Mexican-Americans (N = 52),  $r$  .91 Spanish-speaking Mexican-Americans (N = 45),  $r$  .82.

Internal consistency was assessed using the Spearman-Brown formula to estimate split-half reliability. Additionally, Cronbach's Alpha was computed. This coefficient represents the average of all possible split-half combinations of the data. For dichotomous data such as produced by these tests, Alpha is equivalent to the Kuder-Richardson formula 20. Both the split-half and Alpha coefficients are measures of content sampling. Alpha, however, has the added advantage of measuring the homogeneity of test items. It indicates to what degree the items on the tests are measuring the same thing. The English-speaking Mexican-American group (N = 432) obtained a Spearman-Brown of .81, and an Alpha of .86; the Spanish-speaking Mexican-American group (N = 380) obtained a Spearman-Brown of .81, and an Alpha of .87. These results indicate acceptable internal consistency and homogeneity for the tests for all groups.

Toronto (1977) indicated that several factors support the validity of these receptive tests. First, the scores increased significantly with age. Since abilities in vocabulary recognition increase with age, test scores on a

vocabulary test should likewise increase, if the test is valid. A Pearson's  $r$  of .66 was obtained for the total sample by correlating the age of the children in months with test scores for the total sample of 1,276 children. This demonstrated a relatively strong positive correlation.

Second, these tests are reliable. Reliability is a prerequisite to validity. Third, a strong correlation was demonstrated between these tests and the Bicultural Test of Non-Verbal Reasoning (BTNVR). Since the recognition of differences, similarities, and the completion of analogies which are assessed by the BTNVR are regarded as necessary skills underlying the development of vocabulary and classification of words, it seemed appropriate to correlate these two tests as a measure of validity. They produced a Pearson's  $r$  of .66 for the total sample of 1,276 children (Toronto, 1977).

#### Developmental Test of Visual-Motor Integration

This test was developed by Keith E. Beery (1967). This instrument has a reported validity coefficient of .89 when correlated with chronological age (Buros, 1972). A study of 342 subjects indicated a correlation of .50 with reading achievement for first graders. Another study (N = 60) at three grade levels showed that the correlation with mental age decreases from .59 to .38 from the first to the seventh

grade.

Based on a small sample, a Kuder-Richardson formula 20 split-half reliability of .93 was obtained for an unknown percentage of the standardization population of 594 children from urban schools. Test-retest administration of the instrument to 171 children resulted in correlations of .83 for boys and .87 for girls. These scores are believed to be spuriously high because they come from the entire range. It is important to note that reliability refers to the consistency of measuring true individual differences, the greater these differences are, the easier it will be to obtain consistent results from one testing to another.

One-thousand-thirty-nine students in Illinois, 57 percent suburban, 26 percent urban, 17 percent rural, participated in the norming procedure. All students were identified by teachers and administrators as average in ability. This test has been reported to be an adequate tool for the detection of problems in visual-motor integration (Buros, 1972).

#### Bicultural Test of Non-Verbal Reasoning (BTNVR)

This test was designed for the purpose of identifying children from a mixed population of Anglo and Mexican-American children whose performance in non-verbal reasoning differs from that of their peers. The test consists of sixty-five items and has an age range from 4.0 to 10.11



years.

For purposes of standardization, subjects between the ages of 4.0 and 10.0 were drawn from three groups. Age norms were developed for Anglo-American children, predominantly English-speaking Mexican-American children, and predominantly Spanish-speaking Mexican-American children. A total of 1,276 children were included in the standardization process. Children were evenly distributed within each age level by three-month intervals to ensure a true continuum of age. Male and female children were evenly distributed throughout the sample.

A random sample of 152 children, were retested by a different examiner one month after original testing. A Pearson product-moment correlation of .86 was obtained between test and retest scores. Split-half reliability was computed using odd and even items for each test, and the Spearman-Brown formula was used to calculate a coefficient of .82 (N=1,276) which indicates good internal stability.

Cronbach's Alpha was also computed. The Alpha coefficient indicates the degree to which items of a test are measuring the same thing. An Alpha of .91 (N=1,276) was obtained for this instrument, demonstrating good internal consistency and indicating the items on the tests are homogeneous.

It was reported (Toronto, 1977) that scores on this

instrument increased significantly with age. Since abilities in reasoning increase with age, test scores on a test purporting to measure reasoning must also increase, if the test is valid. A Pearson correlation of .67 was obtained for the total sample of 1,276 subjects, showing a strong positive correlation (Toronto, 1977).

In another study, the BTNVR was correlated with the Columbia Mental Maturity Scale (CMMS), 3rd edition (Burgermeister, Blum, & Lorge, 1972). The CMMS has been standardized on children between the ages of 3.6 and 9.11. Forty-five children were randomly selected from all age levels of the standardization sample and they were given the CMMS within one month of primary testing. The percentile scores obtained by the children from each test were correlated and produced a Pearson correlation of .59. This indicates that this instrument is probably testing the same phenomenon as the CMMS. The CMMS manual reports a validity coefficient of .67 with the Stanford-Binet, form L-M.

#### Index of Home Educational Environment

Dave's rating scales (1963) provide a measure of the educational environment in the home. Dave developed an interview schedule within a framework of six environmental process variables identified from the literature. Twenty-one process characteristics were identified for each variable, and rating scales were developed for each of them. Ratings

for the process characteristics are combined into scores for each process variable and these scores are, in turn, summed to yield a single score that is the Index of Home Educational Environment (IEE).

Validity and Reliability estimates for Dave's instrument have been reported to be satisfactory. Construct validity was established by demonstrating that the relationship between academic achievement and the IEE is greater than the relationship between academic achievement and socio-economic variables such as social class, occupation of the father, and education of the parents. Dave, furthermore, states that:

The correlation between the Index of Educational Environment and the total achievement scores, which is .799, indicates the predictive validity of the instrument, where the total achievement score is the criterion variable. The correlation indicates that the proportion of variance of the criterion variable accounted for by the Index of Educational Environment is .638 (Dave, 1963, p. 75).

The reliability of the instrument was estimated by using Hoyt's two-way analysis of variance method. The reliability coefficient obtained was .95. Dave also studied the stability of the results in relation to sample size ( $N = 60$ ) and concluded that the results obtained from the sample in this study were stable and thus reliable.

### Torrance Test of Creative Thinking

This test consists of the Torrance Creating With Pictures and the Torrance Creating With Words subtests. In this study only the Torrance Creating With Pictures was utilized.

The Torrance Test of Creating With Pictures (TTCP) consists of three activities. In activity one, the testees are instructed to draw whatever they want with the proviso that a curved shape provided in the test booklet be used as a part of the complete picture. The students are told "to think of a picture that no one else will think of" (Torrance, 1972, p. 8). When they have completed the picture, they are told to provide a name or a title for it. This activity yields scores on originality and elaboration.

In activity two, the students are supplied with ten incomplete figures, then asked to add lines to them to sketch "some interesting objects or pictures" (Torrance, 1972, p. 8). This activity and the next activity yield scores on fluency, flexibility, originality, and elaboration.

In activity three, thirty pairs of lines are arranged in ten rows, three pairs to each row. The examinees are asked to draw, within a ten-minute time span, as many objects or pictures, as they can which include the thirty pairs of lines.

A review of studies of the reliability and validity of Torrance's tests on creativity indicates that the consistency

of scoring and agreement between scorers on these tests is quite high (Callahan, 1978). According to Wallach (1970), the parts of the tests likely to evaluate creativity apart from intelligence are ideational fluency and fluency-related forms of originality. Torrance (1974) reported that mean reliability coefficients for the figural tests range from .88 for originality to .96 for fluency. Test-retest reliabilities range from .50 to .93 over one to two week periods, and from .35 to .73 over three year periods (Buros, 1972). In reference to validity, Torrance has stated that since a person can behave creatively in an almost infinite number of ways, it is impossible to provide all researchers and potential users of tests of creative thinking satisfactory evidence of validity. "The concept of an overall validity coefficient for tests of creative thinking ability is grossly inappropriate" (1974, p. 21). Torrance considered creativity as a process. With this approach, one can then think in terms of the kinds of abilities necessary for the successful operation of the process in various situations or for the production of various kinds of products.

One can also think in terms of the qualities of the products resulting from the process. One can describe the personality characteristics, group dynamic variables, and other environmental characteristics that facilitate or impede the kind of functioning described by the process definition

(Torrance, 1974). This is the general approach used by Torrance in developing and validating tests of creative thinking.

A large number of studies employing this instrument have been conducted to increase understanding of the qualities being measured by the tests. Some of these studies have involved simple correlations between the creativity test scores and other measures. Fleming and Weintraub's (1962) examination of the relationship between rigidity and measures derived from the TTCT among a group of 68 elementary students, reported a coefficient of correlation of  $-.41$  (significant at better than the  $.01$  level). The attitudinal rigidity score also correlated  $-.37$ ,  $-.40$ , and  $-.32$  with the originality, fluency, and flexibility scores, respectively. Yamamoto (1963) reported coefficients of correlation of  $.49$  and  $.51$  on the relationship between creativity (TTCT) and the imaginative stories of 5th and 6th graders, respectively. Lieberman (1965) reported that playfulness (rated on five aspects: physical, social, and cognitive spontaneity; manifest joy; and sense of humor) correlated significantly with fluency, flexibility, and originality (coefficients of correlation ranging from  $.21$  to  $.36$ ). Alson (1971) reported that measures of motor creativity (Wyrick Test of Motor Creativity) were positively and significantly correlated with the measures of figural and verbal creativity for boys and

girls separately, and for the total group. All of these studies have thus contributed to the construct validity of the TTCT.

When the manual of the TTCT was republished in 1974, five long-range prediction studies had been reported. Torrance (1974, p. 45) summarized the results of these studies in a table which is reproduced as Table 4. The first long-range prediction study was conducted in 1958 with 325 elementary education majors at the University of Minnesota as subjects. Eight years later, follow-up data were obtained from 114 of the subjects still working in elementary education (Torrance, Tan & Allman, 1970). A composite index of creative teaching behavior was devised and found to correlate .62 with the originality score and .57 with the total creativity score.

Means and Standard Deviations are provided for this instrument. Raw scores are converted to T scores. Overlap between scales (intercorrelational studies) have been reported, suggesting that independent traits are not clearly measured. This problem would probably have a greater impact on predictive studies than on the assessment of cognitive functioning, particularly if the total score is used.

#### Research Methodology

The present investigation was concerned with the degree

Table 4

Summary of Long-Range Predictive Validity Studies of the  
Torrance Test of Creative Thinking\*\*

Investigator and Date	Sample	Number	Length Study	Behavior Predicted	T
Torrance, Tan	Junior Elem.	114	8 yrs.	Creative Teaching	.62*
& Allman, 1970	Ed. Majors			Behavior	.57*
Torrance, 1969	12th graders	46	7 yrs.	Highest Creative Achievement	.50*
				Quantity Creative Achievement	.46*
				Creativeness of Aspiration	.51*
Cropley, 1971, 1972	7th graders	111	5 yrs.	Creative Achievement out of School	.51*
Torrance, 1971 b	7-12 graders	236	12 yrs.	Quantity & Quality of Creative Achievements	.51*
	Females	117	12 yrs.		.46*
	Males	119	12 yrs.		.59*

\*Significant at better than the .01 level.

\*\*Torrance, 1974, p. 45.



of figural creativity in two groups of students; consequently, the research methodology was causal-comparative. The causal-comparative method is aimed at the discovery of possible causes for a behavior pattern by comparing subjects in whom this pattern is present with similar subjects in whom it is absent or present to a lesser degree (Born & Gall, 1979).

The causal-comparative method is often used instead of the experimental method to test hypotheses about cause-and-effect relationships because many of the relationships that are studied in behavioral science do not permit experimental manipulation. As Sax (1968) stated, it is experimental because an attempt is made to infer causal relationship; it is also descriptive in the sense that the investigator had no direct control of experimental conditions.

Kerlinger (1964) defined it as a design in which the independent variable(s) have already occurred and in which the investigator starts with the observation of the dependent variable(s); then he examines the independent variable(s) in retrospect for their possible relations to and effects on the dependent variable(s). These variables are factors already present in the population under study. It is the researcher's responsibility to determine which variables exert the greatest impact upon a particular factor being investigated and whether there is a causal relationship among them.

Interpretation of causal-comparative findings are

limited because the researcher does not know whether a particular variable is a cause or a result of the behavior pattern being studied (Borg & Gall, 1978). In this study, for example, one cannot say definitely what the relationship between bilingualism and figural creative behavior is from a causal perspective: Did being bilingual cause one group to respond in a particular way, or was some other variable interacting to cause them to respond differently from the other group? Kerlinger (1964) stated that this method has three major weaknesses: a) the inability to manipulate independent variables; b) the lack of power to fully randomize; and c) the lack of thorough control, hence the risk of improper interpretation. Despite these problems of interpretation, this method is useful for identifying possible causes of observed variations in behavior patterns. The causal-comparative approach may yield more results in less time than the experimental method (Borg & Gall, 1978).

Kerlinger (1964) also pointed out some of the values of this design by saying that many important variables in behavioral research, such as intellectual ability, aptitude, home background, parental upbringing, socio-economic background, creative ability, and bilingualism are not manipulatable. The causal-comparative research design is the appropriate method of psychological research for this study because the dependent variable, figural creative behavior, is

one which is difficult to manipulate experimentally but which does exist in all people, thus deserving investigation.

### Statistical Procedures

The following null hypotheses were tested by statistical tests as described below. The level of significance for rejecting the null hypotheses was set at .05. This level of significance equated the possibilities of a Type I and Type II error. With this level of significance, it was expected that incorrect decisions could be minimized in this study.

H<sub>1</sub>: Spanish-English Proficient (SEP) female students will not score higher or lower ( $p < .05$ ) than Limited-English Proficient (LEP) students in figural fluency, flexibility, originality and elaboration as measured by the Torrance Test Of Creative Thinking, Figural Form A.

H<sub>2</sub>: No difference exists between female students from a relatively high index of home educational environment (IEE) and those from a low IEE in figural fluency, flexibility, originality, and elaboration, as measured by the IEE and the Torrance Test of Creative Thinking (TTCT), Figural Form A.

H<sub>3</sub>: No interaction exists between language ability and the IEE variables on figural fluency, flexibility, elaboration, and originality as measured by the Toronto Tests of Receptive Vocabulary, the IEE and the TTCT, Figural Form A.

H<sub>4</sub>: No relationship exists between figural fluency,

flexibility, originality, and elaboration and Achievement Press; Language Models; Academic Guidance; Activeness of the Family; Intellectuality in the Home; and Work Habits in the Home for the LEP group.

H<sub>5</sub>: No relationship exists between figural fluency, flexibility, originality, and elaboration, and Achievement Press; Language Models; Academic Guidance; Activeness of the Family; Intellectuality in the Home; and Work Habits in the Home for the SEP group.

Analysis of Variance (ANOVA) was used to test the first three hypotheses due to the particular kind of data collected by this study. The Pearson Product-Moment procedure was used to test the hypothesis pertaining to the relationship between each subtest of the Torrance and each of the six IEE variables, namely Achievement Press; Language Models; Academic Guidance; Activeness of the Family; Intellectuality in the Home, and Work Habits in the Home.

### Summary

In Chapter 3 the design and procedures of the study have been presented. Five main topics have been discussed:

(a) population and sample of the study; (b) selection of SEP and LEP groups; (c) description of the instruments; (d) research methodology; and (e) statistical procedures. The level of significance for accepting the hypotheses tested

was set at .05. A listing of the hypotheses investigated in this study was also included. Chapter 4 presents the findings of the study which resulted from the administration and procedures specified in Chapter 3.

## Chapter 4

### Findings of the Study

It was the purpose of this study to investigate the degree of figural creative thinking of LEP and SEP elementary school girls as measured by the Torrance Test of Creative Thinking (TTCT) Figural Form A; and to examine the relationship of creative thinking to selected home environment variables, as measured by the Index of Home Educational Environment (IEE).

This chapter presents the findings of the investigation in six sections: (a) comparisons between female SEP and LEP students on the figural test, (b) comparisons between female students with a high index of home educational environment (IEE) and those with low IEE scores on the figural test, (c) comparisons between linguistic groups (SEP and LEP) and the six IEE process variables on the test of figural creativity, (d) correlations between the figural fluency, flexibility, originality, and elaboration scores, and the six variables of the IEE for the SEP group, (e) correlations between the figural fluency, flexibility, originality, and elaboration scores, and the six variables of the IEE for the LEP group, and (f) a summary of the findings.

### Results of the Figural Test

The means and standard deviations of the students on the SEP and LEP groups were calculated for each dependent measure (see Table 5). Univariate F tests were applied to determine if there were significant differences between group means on the dependent variables (see Table 6).

No significant differences were found for the main effect of linguistic group. Thus, the null hypothesis that there were no significant mean differences between the LEP and SEP groups in figural fluency, flexibility, originality, and elaboration could not be rejected.

#### Comparisons Between Female Students with High Index of Home Educational Environment (IEE) and Low IEE, on the Figural Test

The second section of this study dealt with possible interactions between home educational environment (IEE) variables and measures of figural creativity. In Chapter 3 the following null hypothesis was stated:

H<sub>2</sub>: No difference exists between female students from a relatively high index of home educational environment (IEE) and those from a low IEE in figural fluency, flexibility, originality, and elaboration, as measured by the IEE and the Torrance Test of Creative Thinking (TTCT), Figural Form A.

Students classified as low on the IEE consisted of

Table 5

Means and Standard Deviations of the Scores  
on the TTCT Subscales by Linguistic Group

Linguistic Group	N		Figural Fluency	Figural Flexibility	Figural Originality	Figural Elaboration
		Mean	61.11	66.08	57.90	35.83
LEP	30	S.D.	12.5	15.12	14.5	15.27
		Mean	61.29	68.62	60.0	40.22
SEP	31	S.D.	12.2	13.4	15.6	14.0

Table 6

Univariate  $F$  Tests for Figural Creativity  
Measures by Language Group

Independent Variable	Dependent Variable	Sign. of $F$
Linguistic Group	Fluency	0.956
	Flexibility	0.484
	Originality	0.295
	Elaboration	1.365



those with a total score of thirty through seventy-five and students classified as high on this instrument included those with scores from eighty-six through 140. Students with total IEE scores from seventy-six through eighty-five were eliminated.

This breakdown allowed a higher percentage of cases to be included in this investigation. Sixty-nine percent of all students were included in this analysis.

An examination of Table 7 demonstrates that hypothesis H<sub>2</sub> could not be rejected. There was no interaction between those variables. There were no differences between female students from a relatively high IEE and those from a low IEE in figural fluency, flexibility, originality, and elaboration, as measured by the IEE and the TTCT, Figural Form A. Also, there were no differences between the linguistic groups on this variable.

#### Comparisons Between SEP and LEP Groups and the IEE Variables in Figural Creativity

The third aspect of this study concerned the interaction of linguistic group and home educational environment (IEE) variables on the figural creativity scores. As stated in Chapter 3, the null hypothesis was:

H<sub>3</sub>: No interaction exists between language ability and the IEE variables on figural fluency, flexibility, elaboration, and originality as measured by the Toronto Tests of

Table 7

Fluency, Flexibility, Originality, and Elaboration, by  
Linguistic Group, by High and Low IEE

Independent Variable	Dependent Variable	Sign. F.
Linguistic	Fluency	0.85
IEE	Fluency	0.84
Linguistic	Flexibility	0.97
IEE	Flexibility	0.78
Linguistic	Originality	0.77
IEE	Originality	0.92
Linguistic	Elaboration	0.48
IEE	Elaboration	0.65
Linguistic by IEE	Fluency	0.93
Linguistic by IEE	Flexibility	0.53
Linguistic by IEE	Originality	0.32
Linguistic by IEE	Elaboration	0.12

Receptive Vocabulary, the IEE and the TTCT, Figural Form A.

The median score was selected for each IEE variable to define the relative high and low values (see Appendix E, page 152). An examination of Table 8 demonstrates that hypothesis  $H_3$  was generally tenable. No predominant pattern of interactions between these variables was found. There were no differences between female students with relatively high IEE variables scores and those with low IEE variables scores on figural fluency, flexibility, originality, and elaboration, as measured by the IEE and the TTCT, Figural Form A.

In general, there were no differences between the linguistic groups on these variables. Three of the six IEE rating scales, however, interacted significantly ( $p < .05$ ) with the fluency subtest (see Figure 2).

Correlations Between the TTCT Scores and the IEE Variable Scores for the SEP Group

The fourth area of investigation examined possible correlations between the TTCT scores and the IEE scores for the SEP group. The null hypothesis was:

$H_5$ : No relationship exists between figural fluency, flexibility, originality, and elaboration, and Achievement Press; Language Models; Academic Guidance; Activeness of the Family; Intellectuality in the Home; and Work Habits in the

Table 8  
 Fluency, Flexibility, Originality, and Elaboration by  
 Linguistic Group by Academic Press, Language Models,  
 Academic Guidance, Activeness in the Family,  
 Intellectuality in the Home, and Work  
 Habits in the Home

Independent Variable	Dependent Variable	F
Linguistic	Fluency	0.77
Academic Press	Fluency	0.91
Language Models	Fluency	0.87
Academic Guidance	Fluency	0.99
Activeness in the Family	Fluency	0.87
Intellectuality in the Home	Fluency	0.49
Work Habits in the Home	Fluency	0.87
Linguistic	Flexibility	0.63
Academic Press	Flexibility	0.32
Language Models	Flexibility	0.44
Academic Guidance	Flexibility	0.25
Activeness in the Family	Flexibility	0.70
Intellectuality in the Home	Flexibility	0.60
Work Habits in the Home	Flexibility	0.81

Table 8 (Continued)

Independent Variable	Dependent Variable	<u>F</u>
Linguistic	Originality	0.82
Academic Press	Originality	0.74
Language Models	Originality	0.82
Academic Guidance	Originality	0.96
Activeness in the Family	Originality	0.23
Intellectuality in the Home	Originality	0.39
Work Habits in the Home	Originality	0.65
Linguistic	Elaboration	0.37
Academic Press	Elaboration	0.49
Language Models	Elaboration	0.68
Academic Guidance	Elaboration	0.73
Activeness in the Family	Elaboration	0.94
Intellectuality in the Home	Elaboration	0.82
Work Habits in the Home	Elaboration	0.69
Two-Way Interactions		
Linguistic by Academic Press	Flexibility	0.58
Linguistic by Language Models	Flexibility	0.11
Linguistic by Academic Press	Flexibility	0.49

Table 8 (Continued)

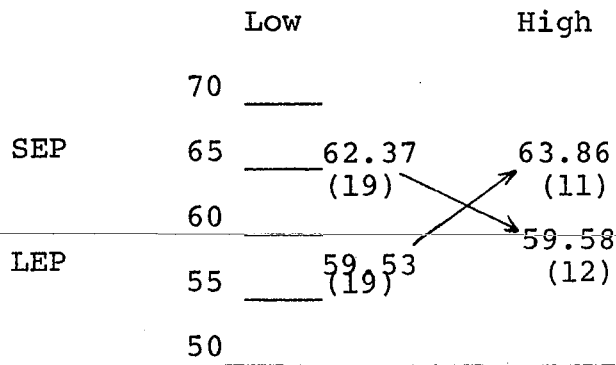
Independent Variable	Dependent Variable	<u>F</u>
Linguistic by Activeness in the Family	Flexibility	0.30
Linguistic by Intellectuality in the Home	Flexibility	0.16
Linguistic by Work Habits in the Home	Flexibility	0.15
Linguistic by Academic Press	Fluency	0.49
Linguistic by Language Models	Fluency	0.04*
Linguistic by Academic Guidance	Fluency	0.31
Linguistic by Activeness in the Family	Fluency	0.08
Linguistic by Intellectuality in the Home	Fluency	0.02*
Linguistic by Work Habits in the Home	Fluency	0.02*
Linguistic by Academic Press	Originality	0.81
Linguistic by Language Models	Originality	0.44
Linguistic by Academic Guidance	Originality	0.96
Linguistic by Activeness in the Family	Originality	0.74
Linguistic by Intellectuality in the Family	Originality	0.11
Linguistic by Work Habits in the Home	Originality	0.25

Table 8 (Continued)

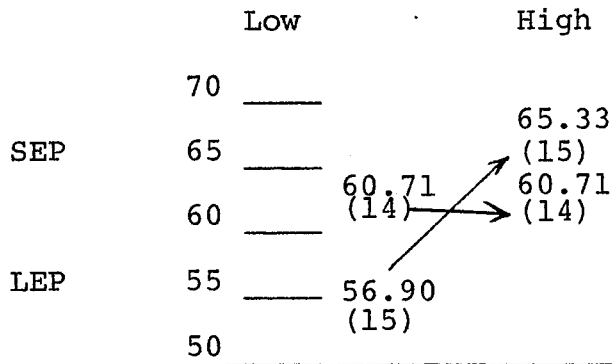
Independent Variable	Dependent Variable	F
Linguistic by Academic Press	Elaboration	0.14
Linguistic by Language Models	Elaboration	0.67
Linguistic by Academic Guidance	Elaboration	0.21
Linguistic by Activeness in the Family	Elaboration	0.57
Linguistic by Intellectuality in the Family	Elaboration	0.62
Linguistic by Work Habits in the Home	Elaboration	0.66

\*Significant at  $p < .05$ .

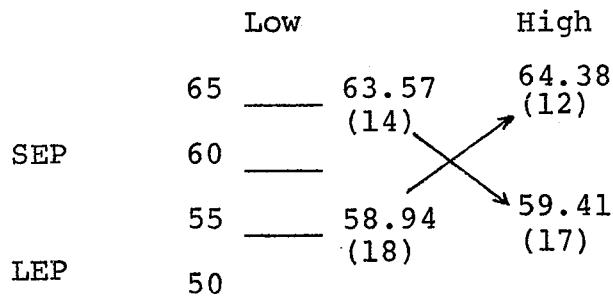
### Fluency by Linguistic Group by Language Models



### Fluency by Linguistic Group by Intellectuality in the Family



### Fluency by Linguistic Group by Work Habits in the Family





Home for the SEP group.

The means and standard deviations of the female students in the SEP/LEP group on each variable were calculated (see Table 9). Table 10 demonstrates that for the SEP group tested, there was a positive correlation between Elaboration, Achievement Press, and Academic Guidance. This positive relationship indicated that SEP students who showed greater amounts of Elaboration in response to a figural stimulus also showed higher Achievement Press and Academic Guidance on the home environment profile.

The results summarized in Table 10 also demonstrate that there was no correlation between figural fluency and other IEE variables, nor between the other figural measures and the IEE variables.

#### Correlations Between the Figural Measures and the IEE Process Variables for the LEP Group

The final area of investigation examined possible correlations between the figural scores and the IEE scores of the LEP group. The null hypothesis was:

H<sub>4</sub>: No relationship exists between figural fluency, flexibility, originality, and elaboration and Achievement Press; Language Models; Academic Guidance; Activeness of the Family; Intellectuality in the Home; and Work Habits in the Home for the LEP group.

Table 9  
Means and Standard Deviations of Female Students in SEP/LEP Groups

Variable	SEP Group			LEP Group		
	Cases	Mean	Std.Dev.	Cases	Mean	Std.Dev.
Achievement Press	30	31.36	10.12	30	30.06	8.62
Language Models	30	11.76	3.13	30	11.76	2.95
Academic Guidance	30	12.30	5.27	30	11.13	4.62
Activeness in the Family	30	14.96	5.55	30	13.66	4.13
Intellectuality in the Home	30	7.46	2.90	30	6.96	2.39
Work Habits	30	8.56	3.61	30	7.53	3.14
Total IEE	30	86.00	29.33	30	81.20	23.95
Fluency	31	61.29	12.21	30	61.11	12.53
Flexibility	31	68.62	13.44	30	66.08	15.12
Originality	31	60.00	15.61	30	57.90	14.55
Elaboration	31	40.22	14.07	30	35.83	15.27

Table 10

Correlations Between the TTCT Scores and the IEE Scores of the SEP Group

	Achievement Press	Language Models	Academic Guidance	Activeness in the Family	Intellectu- ality in the Home	Work Habits	Total Score
Fluency	-0.04 (N30) p=0.40	-0.09 (N30) p=0.31	-0.04 (N30) p=0.41	-0.04 (N30) p=0.41	-0.03 (N30) p=0.42	-0.03 (N30) p=0.42	-0.05 (N30) p=0.39
Flexibility	-0.07 (N30) p=0.34	-0.09 (N30) p=0.30	-0.08 (N30) p=0.32	-0.03 (N30) p=0.42	0.02 (N30) p=0.45	-0.06 (N30) p=0.36	-0.06 (N30) p=0.35
Originality	0.09 (N30) p=0.31	-0.02 (N30) p=0.44	0.05 (N30) p=0.38	-0.01 (N30) p=0.48	0.07 (N30) p=0.34	0.01 (N30) p=0.47	0.04 (N30) p=0.40
Elaboration	0.32 (N30) p=0.04	0.13 (N30) p=0.24	0.29 (N30) p=0.05	0.16 (N30) p=0.19	0.18 (N30) p=0.16	0.26 (N30) p=0.08	0.26 (N30) p=0.07

Table 11 demonstrates that for the LEP group tested, there was a positive correlation between figural fluency and Academic Guidance, Language Models, Activeness in the Family, Work Habits in the Family, and the total IEE score. There was no correlation between figural fluency and other IEE process variables, nor between the other figural measures and the IEE process variables.

### Summary

The findings of this study can be summarized as follows:

(1) When SEP and LEP students were compared on the TTCT test, no significant effects by linguistic group were found.

(2) When students with high and low IEE scores were compared on the TTCT, no differences between the linguistic groups were found.

(3) When comparisons were made between linguistic groups and the six IEE variables, there were, in general, no differences between linguistic groups on the TTCT variables. Three of the six IEE variables, however, interacted ( $p < .05$ ) with the fluency subtest of the TTCT.

(4) When the relationship between the TTCT scores and the six IEE variables for the SEP group were analyzed, it was demonstrated that there was a positive association between the figural elaboration subtest of the TTCT and two

Table 11

Correlations Between the TTCT Scores and the IEE Scores of the LEP Group

	Achievement Press	Language Models	Academic Guidance	Activeness in the Family	Intellectu- ality in the Home	Work Habits	Total Score
Fluency	0.23 (N30) p=0.10	0.30* (N30) p=0.04	0.30* (N30) p=0.05	0.36* (N30) p=0.02	0.19 (N30) p=0.15	0.35* (N30) p=0.02	0.30* (N30) p=0.04
Flexibility	0.04 (N30) p=0.40	0.08 (N30) p=0.33	0.05 (N30) p=0.38	0.19 (N30) p=0.14	0.07 (N30) p=0.35	0.17 (N30) p=0.17	0.10 (N30) p=0.29
Originality	0.10 (N30) p=0.29	0.19 (N30) p=0.17	0.19 (N30) p=0.15	0.18 (N30) p=0.16	0.02 (N30) p=0.44	0.25 (N30) p=0.08	0.16 (N30) p=0.19
Elaboration	0.04 (N30) p=0.41	0.05 (N30) p=0.39	0.09 (N30) p=0.30	0.13 (N30) p=0.24	-0.05 (N30) p=0.38	0.19 (N30) p=0.15	0.08 (N30) p=0.33

IEE variables. It was also shown that there were no other correlations between figural elaboration and other IEE variables, nor between other figural measures and the IEE variables.

(5) When the relationships between the TTCT scores and six IEE variables for the LEP group were analyzed, it was found that there was a positive correlation between figural fluency and five IEE variables, including the total IEE score. There was no correlation between figural fluency and other IEE variables, nor between the other figural measures and the IEE variables.

## Chapter 5

### Summary, Discussion, Limitations, and Recommendations

Previous studies have shown a positive relationship between bilingualism and the verbal and non-verbal areas of cognitive functioning. Would the positive effect of bilingualism also manifest itself among younger Hispanic-American girls? When the perceptual prerequisites of figural creativity are controlled, would the "symbolic flexibility" effect previously investigated (Peal & Lambert, 1962; Ben Zeev, 1972) also emerge in this area which presumably does not depend on verbal strategies? Finally, what would be the effect of home educational environment factors (Dave, 1963) on the creative abilities of Hispanic girls?

It was the purpose of the study to investigate:

(a) the non-verbal figural creative behavior of SEP and LEP girls, as measured by the figural form of the TTCT; and (b) the relationship of figural creative behavior and selected home educational environment variables, as measured by the IEE. The causal-comparative design was used in this study because it was not possible to manipulate the independent variables, namely the degree of bilingualism, and the home environmental factors. Statistical tests used in this study were the two-way ANOVA and the Pearson product-moment

correlation. The level of significance for rejecting the null hypotheses was set at .05. This chapter was organized under four headings: (a) summary of the study, (b) discussion of the findings, (c) limitations, and (d) recommendations.

#### Summary of the Study

Torrance (1974) discussed the interpretation of the sub-scales of the TTCT. Fluency scores, he stated, reflect the examinee's ability to produce a large number of ideas; flexibility scores represent a person's ability to produce a variety of kinds of ideas, to shift from one approach to another, or from one category of thought to another; the originality scores, Torrance claimed, reflect the examinee's ability to produce ideas that are different from the banal, commonplace, or established; and the elaboration scores represent "the subject's ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas" (p. 59).

In this study no statistically significant differences between the SEP and the LEP females were found on the TTCT scales of fluency, flexibility, originality and elaboration. Thus it would appear that differences did not exist in the creative ability factors examined in the study. This finding contradicted the expectation of the first research hypothesis. It is worth noting, however, that the SEP group



obtained consistently higher mean scores than the LEP females and that the differences found were in the hypothesized direction.

The relationship between figural creative thinking and selected home environment variables was examined in three ways: (a) females with high and low total IEE scores were compared on the tests of figural creativity, (b) the LEP and SEP groups with high and low scores on individual IEE variables were compared on the test of figural creativity, and (c) the degree of association between the TTCT subtests and IEE variables was determined for each linguistic group.

When SEP and LEP girls from homes of high and low IEE were compared, on the measures of figural creativity, no differences in their performance were found. This finding contradicts the expectations of the second research hypothesis, since girls from a high index of home environment (IEE) were expected to attain higher scores on the criterion measures. A closer examination of the mean scores indicated that the SEP girls attained higher scores in figural originality and figural elaboration, equaled the mean scores obtained by the LEP group in figural flexibility, and only scored lower in figural fluency.

The third analysis focused on the comparative performance of linguistic groups when scores on the individual IEE variables were high or low. Generally, these comparisons

showed only modest interactions. The performance of the LEP group on the figural fluency test was significantly higher ( $p < .05$ ) when it interacted with high scores on the following IEE variables: Language Models, Intellectuality in the Home, and Work Habits in the Family. These results were not expected since it was originally hypothesized that differences, if any, would favor the SEP group in interaction with high scores on the IEE variables. The SEP girls, on the other hand, obtained higher mean scores on most of the figural tests in interaction with either high or low IEE variables (see Table 12).

The fourth and fifth analyses examined the degree of association between individual IEE variables and the tests of figural creativity, for each linguistic group. Only modest correlations were obtained.

The SEP group profile indicated significant interactions ( $p < .05$ ) with Achievement Press and Academic Guidance on figural elaboration. The LEP group, in turn, demonstrated significant interactions ( $p < .05$ ) with Academic Guidance, Language Models, Activeness in the Family, and Work Habits in the Home on figural fluency. These findings contradicted predictions since the IEE variables were expected to have a more consistent degree of association with the measures of creative behavior.

Table 12  
 Comparison of the Mean Scores of the SEP and LEP Groups,  
 by High or Low IEE Variable Scores on the  
 Figural Tests of Creativity

Variables	High Input				Low Input			
	Fu	Fx	O	E	Fu	Fx	O	E
AP			SEP	SEP	SEP	SEP		
LM	LEP*	SEP	SEP	SEP				
AG	LEP			SEP	SEP	LEP		
AC	LEP	SEP	SEP	SEP				
IN	LEP*	SEP= LEP	SEP				SEP	
W	LEP*			SEP	SEP	SEP		

\* =  $p < .05$

AP Academic Press

AC Activeness in the Family

LM Language Model

IN Intellectuality in the Home

AG Academic Guidance

W Work Habits in the Home

### Discussion

Before attempting to explore the question of why differences did not occur, it is important to recall the previous discussion of the causal-comparative design. Although it was argued that this design was suitable to the purpose of this study, the limitations of the causal-comparative approach are significant. As Kerlinger (1964) pointed out "compared to experimental research ex post facto [causal-comparative] research lacks control; this lack is the basis of . . . the risk of improper interpretation" (p. 373). Given the research design used in this investigation, it was not possible to demonstrate a cause-and-effect relationship between the creative factors assessed by the TTCT and linguistic proficiency. Nevertheless, the investigator has considered the findings of Peal and Lambert (1962), Cummins (1976), Diaz (1983), Torrance (1970), Carringer (1972), Jensen (1962), Paulston (1975), and Guildford (1971) in interpreting the results of the present study.

### Matching of Subjects

The matching procedure adopted by this investigation demands close scrutiny as an important possible cause of the lack of statistically significant differences. In general,

matching can never assure that the groups under investigation are equivalent on all relevant variables. However, in this study the SEP and the LEP groups were matched on a non-verbal intelligence measure (Toronto, 1977). Thus, the matching procedures of the study may have led to a lack of differences in non-verbal abilities between the two linguistic groups. This is particularly important when it is considered that the groups were also matched in the areas of visual-motor perceptual development and receptive language vocabulary.

This problem illustrates an important research dilemma: it is not clear how to control for potentially extraneous group differences between bilinguals and monolinguals, and, at the same time, study meaningful group differences in cognitive and non-cognitive abilities (Diaz, 1982). It is against this background of methodological paradox, then, that the higher mean scores obtained by the SEP females in this study could have particular meaning.

### Figural Creativity

The SEP females scored consistently higher on all four measures of figural creativity. They also generally attained higher mean scores than their counterparts in most other analyses. These findings are congruent with previous research (Landry, 1974; Carringer, 1972; Torrance et al.,

1970). The differences between the SEP and LEP scores, however, did not reach statistical significance. A possible explanation for these findings could be that the degree of bilingual mastery necessary for enhanced cognitive functioning (Cummins, 1976) had not yet been attained by these elementary age girls.

Supplementary analyses of the interaction between age and linguistic group indicated that, whereas the mean scores for all girls in the intermediate grades were higher ( $p < .00$ ) than the mean scores for primary age girls, the SEP group scored higher on the tests of figural creativity at the intermediate age level, and lower only in fluency and originality at the primary age level (see Appendix F). This finding, although not statistically significant, may suggest a growing differentiation in the figural creative performance of these two groups.

#### Home Educational Environment

Children from comparable socioeconomic backgrounds often differ markedly in educational achievement and creative accomplishment. Differences in the home educational environment may be more sensitive predictors of academic and creative functioning than gross measures of social class. It was anticipated that an analysis of the interaction between home educational variables and linguistic groups

might help to explain the differences in the children's level of creative performance.

As previously stated, the associations found between the IEE variables and the figural tests were limited. This finding explains the lack of interaction between high and low total IEE scores and the girl's performance on the measures of figural creativity. However, a descriptive analysis of the profiles revealed additional information which lends itself to critical interpretation. This analysis indicated that the SEP group would frequently obtain the higher average score on the measure of creativity, although the IEE variable under investigation had been low (see Table 13).

#### Figural Fluency

When the performance of the two linguistic groups was compared on this measure, the LEP females demonstrated higher scores ( $p < .05$ ) when interacting with high values of Language Models, Intellectuality in the Home, and Work Habits in the Home. When the IEE variables were low, however, the SEP girls obtained a higher mean score on 75% of the comparisons.

It is important to note that this finding may suggest that the LEP child has a higher dependence on home educational environment input, in order to develop her ability to generate a significant number of figurative associations in

Table 13

Mean Scores on the TTCT Subtest of the LEP and SEP  
Groups by High and Low IEE Variables

IEE Variables		FU ( $\bar{x}$ =61.20)	FX ( $\bar{x}$ =67.38)	OR ( $\bar{x}$ =58.97)	EL ( $\bar{x}$ =38.07)
AP	(H)	SEP	SEP	SEP <sup>*</sup>	SEP <sup>*</sup>
	(L)	SEP <sup>*</sup>	SEP <sup>*</sup>	LEP	LEP
LM	(H)	LEP*	SEP	SEP <sup>*</sup>	SEP <sup>*</sup>
	(L)	SEP	SEP <sup>*</sup>	SEP	SEP
AG	(H)	LEP <sup>*</sup>	SEP	SEP	SEP <sup>*</sup>
	(L)	SEP	SEP <sup>*</sup>	LEP <sup>*</sup>	LEP
AC	(H)	LEP <sup>*</sup>	SEP <sup>*</sup>	SEP <sup>*</sup>	SEP <sup>*</sup>
	(L)	SEP	SEP	LEP	LEP
IN	(H)	LEP*	SEP=LEP <sup>*</sup>	LEP	SEP <sup>*</sup>
	(L)	SEP	SEP	SEP <sup>*</sup>	SEP
W	(H)	LEP*	LEP	LEP	SEP <sup>*</sup>
	(L)	SEP	SEP <sup>*</sup>	SEP <sup>*</sup>	SEP

\* =  $p < .05$

<sup>\*</sup> = Higher Mean Score

= = Same Mean Score for LEP and SEP

AP Academic Press

AC Activeness in the Family

LM Language Model

IN Intellectuality in the Home

AG Academic Guidance

W Work Habits in the Home



a given amount of time. It has been proposed in the literature (Torrance et al., 1970) that monolinguals would be more fluent because they do not have to contend with the competition of linguistic associations created by bilingualism. The consistently better performance of the SEP girls on this subtest, when the IEE variable input was low, challenged such an interpretation.

It is important to pay attention to the better performance of the SEP group. It suggested that interaction with non-educational home variables, or with educational variables outside the home, may have a differential and seemingly positive effect on the performance of the females in the SEP group.

#### Figural Flexibility

SEP girls, from either high or low IEE homes, scored higher on this subtest in five of the six interactions. When combined with the variable Intellectuality in the Home, they obtained the same mean score as the LEP group. Since four of the five interactions between the IEE variables and the SEP group involved low home educational input, the possibility that this linguistic group may be more able to interact with multiple environmental factors, with concomitant positive effects on this type of creative behavior, was suggested.

Several studies (Vygotsky, 1962; Cummins, 1977) have shown that bilingual children demonstrate an enhanced capacity to focus on linguistic structure and detail. Keeping in mind this characteristic of bilingual children, the performance required by this subtest is relevant to an interpretation of the findings. The test requires the production of different patterns, given a visual stimulus. The words, structure, and pattern share their meaning when one thinks in terms of design, and this may be related to the area of figural creative behavior. The possibility of a generalized flexibility effect, which would include visual perceptual processes, as an effect of bilingualism on cognitive functioning, was suggested by the findings of this study.

#### Figural Originality

This subtest measures the examinee's ability to produce ideas, represented figurally, which differ from the normative dominant responses to the test stimulus. Although the SEP group scored consistently higher on this measure, thus confirming previous findings (Torrance et al., 1970; Landry, 1974; Carringer, 1972) a breakdown by high and low IEE variable input was particularly revealing. It was interesting to see that high scores on the IEE variables made an important difference in the performance of both linguistic groups on this subtest.

Whereas high scores on the IEE variables accompanied three of the higher SEP means, high scores were not similarly associated with the performance of LEP students. The LEP group scored high only when interacting with low home input in Academic Guidance.

Although it has been suggested that these children's minority status may enhance their ability to produce original ideas (Torrance, 1982), these profiles suggest the need to consider other factors. Minority students are frequently the victims of differential treatment (U.S. Commission on Civil Rights, 1973), furthermore, both the LEP and the SEP girls in this study were members of the lower socioeconomic class. As a rule, their bilingualism was not a matter of personal choice (Paulston, 1975). This form of bilingualism has been associated in the literature with negative attitudes toward the use of a minority language (Diaz, 1983).

Originality may require more supportive input from the home for the SEP child. In contrast, the LEP girl, until attaining a higher level of acculturation and some bilingual proficiency, may confront social contingencies which would reinforce avoidance of personal prominence, regardless of how high the home input may be in some of these IEE variables.

### Figural Elaboration

The SEP girls scored consistently higher on this measure when interacting with high IEE scores. When the IEE input was low, they maintained their position when interacting with Language Models, Intellectuality in the Home, and Work Habits in the Home. The LEP group obtained higher means in conjunction with low scores on the IEE variables of Academic Press, Academic Guidance, and Activeness in the Family, on this figural subtest.

The better performance of the SEP group was congruent with prior research findings (Torrance et al., 1970; Carringer, 1972) and a related investigation (Guilford, 1971). It has been previously suggested (Torrance, 1982; Guilford, 1971) that the ability to embellish or otherwise elaborate ideas may be an area of performance where minority children have a tendency to achieve a better performance.

Prior investigators, however, have found the criteria for scoring elaboration to be unclear and have not interpreted findings from this measure (Diaz, 1983). The present investigation included the measure and reported the results, but will adopt current research practice by not interpreting them.

### Limitations of the Study

The predominance of higher mean scores for the SEP

group suggested that the positive effects of bilingualism found in other studies may have just begun to emerge in these students. This pattern of higher scores does demonstrate that bilingualism does not have a detrimental effect on non-verbal creativity. In fact, the T scores of the bilingual group are, for the most part, significantly above the norm. It is possible that this investigation may have tapped into an important stage of linguistic transition, a time when differentiation of cognitive performance between these two groups begins to increase.

This tentative hypothesis must be viewed, not only against the background of prior research, but also in relation to the limitations of the present study. No consideration was given to variability in second language training or acquisition histories of the subjects: the SEP girls were treated as a homogeneous group. These factors could be important since, for instance, the degree of bilingualism of an individual may depend on specific situations. Furthermore, although information was collected regarding the level of receptive vocabulary in Spanish for the LEP group, and in English and Spanish for the SEP group, no information regarding the level of expression in either language is available.

The linguistic prerequisites of the TTCT should also be considered. Although figural by definition, these tests may

not be necessarily non-verbal. The examiner provided oral directions, and the testing situation involved a social context where paralinguistic cues may have been present. This suggests that perhaps a lower level of linguistic proficiency may have been required to conduct this task.

The impact of affective factors known to be associated with bilingualism among children of lower socioeconomic level was not considered. The influence of these factors on the creative performance of these girls is unknown at this time.

The lack of information-processing studies of bilingual children must also be mentioned. Particularly needed at this time are comparative studies which explore possible differences in cognitive processes or processing strategies between bilinguals and monolinguals. At present we lack a reliable process model of how bilingualism affects cognitive abilities or accelerates cognitive development (Diaz, 1983).

Despite the problems of interpretation posed by the research method used, this investigation was useful for identifying possible causes of observed variations in behavior patterns. Since the causal-comparative method may yield more results in less time (Borg & Gall, 1978), it was the most appropriate way of exploring this area of study.

#### Recommendations

Based on the results of this research, the investigator

proposes the following recommendations:

- a) Additional studies should be conducted using less strict matching techniques to verify findings in this study.
- b) Studies of the figural creative behavior of students with similar second language acquisition histories should be conducted to determine the effect of different levels of bilingualism on cognitive functioning.
- c) Additional studies should be conducted with the IEE profile to determine if additional home educational process variables need to be incorporated when testing LEP or SEP students.
- d) Studies that investigate the potential interaction between IEE variables and community educational variables on creative performance are also necessary.
- e) Studies designed to investigate potential differences in the processing of non-verbal information between bilingual and monolingual children are also very important.
- f) Investigations that collect information on the impact of increasing bilingualism on the differential processing strategies of non-verbal stimuli may help to elucidate issues pertaining to "symbolic flexibility" effect.
- g) Finally, there is also a need for systematic studies of the effect of radical shifts in family organization (e.g., divorce) and the creative behavior of LEP and SEP children.

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APPENDICES

APPENDIX A

INTERVIEW SCHEDULE

## APPENDIX A

### INTERVIEW SCHEDULE

Statement of Purpose: This is a study of differences in home backgrounds of elementary school children. We are trying to get an estimate of the variety of home situations in your community. The reason for this is to have the schools take this kind of information into account in planning educational programs. Thus, this study is for research purposes.

Guarantees:

1. Anonymity of parents
2. No interviewing or testing of your child in connection with this study.

Request: It is essential to have a very accurate response to each of the questions. However, if a question is believed to be an invasion of your privacy, feel free to not answer it. We would rather have no response to some questions than inaccurate responses. Also, please answer the questions on behalf of you and your husband.

1. How many children do you have? What are their ages? Sexes? In what grades are they? In what schools? Note: If not in school, determine whether employed and/or separated from the family. Complete the first table of the information blank. Is any child in your family adopted?

Complete the balance of the information blank.

Pointing out the Subject: We are going to talk about your fifth grade child (name him). We will probably be referring to the others on occasion, but our discussion will be mainly about . . . (name).

2. How does he generally do in school?  
What grades does he usually receive?  
What are his best subjects? His weakest?

Best

Weakest



3. What subjects has he improved in most in the past year? The least?

Most

Least

4. How do you feel about his school progress?  
What grades do you expect him to receive?  
What grades satisfy you?

Expect

Satisfy

5. How do your other children generally do in school?

6. What organizations or clubs, if any, do you belong to (PTA, Church, Political, etc.)?  
Does your child know what you do in these organizations? \_\_\_ Yes \_\_\_ No, How?

7. What are your favorite recreation pastimes? Your husband's?  
What recreational activities do you and your family engage in on weekends together?  
What places have you visited on weekends during the past six months? Why?

Mother      Father      Family      Visits      Reasons

8. Do you usually plan your weekends and vacations ahead of time? \_\_\_ Yes \_\_\_ No. How often?  
Who makes the plans?

9. Where have you, as a family, traveled during the past two years?  
Why were these places chosen?  
What specific activities take up most of your time at these places?

Places

Reasons

Activities

10. What newspapers and/or magazines do you subscribe to?  
Do you encourage your child to read them? If so, how?  
Do you discuss the articles or stories in them in his presence? (Give examples)  
Does your child ever participate in these discussions-vs. listening?
11. Does your child take any lessons--musical, dance, academic subject?  
If so, what?  
How long has he taken these?  
How did he get started in this area?
12. What hobbies, if any, does your child have?  
How long has he been interested in this?  
What seemed to get him started in this area? (Note parent initiation)
13. What kinds of toys, games, books, pamphlets, etc. have you bought for your child in the past two years? (Includes birthdays and holidays). Give examples.  
Preschool period? List
14. Does your child have a library card?  Yes  No  
If so, how long has he had it?  
Do you remember the first few times he went to the library? Did anyone accompany him? Who?  
What kind of books have you encouraged him to read?  
Where else does he obtain reading material?
15. What appliances do you permit him to operate?  
How long have you allowed this?

16. Do you ask your child problems related to school subjects that he is required to answer or solve on his own? Give examples.

17. Does your child have a desk of his own?     Yes     No.  
If not, where does he study?  
What kinds of supplies are available for him to work with? (Observe)

    paste     compass  
    paper     protractor  
    paints     ruler  
    crayons     others  
(Specify    )

18. Do you have a dictionary in your home? If so, what kind?

Does your child have a dictionary of his own? If so, what kind?

Where are they kept?

How often does your child use the dictionary?

How often do you?

When the child uses the dictionary, at whose initiation--his or yours?

What other ways does your child have of learning new words? School, relatives, etc.

Home dictionary:     Yes     No     Child's dictionary:

    Yes     No    

Name

Name

Use

Use

19. Do you have an encyclopedia in your home?     Yes     No  
If so, what kind?

When did you get it? Why?

Do you buy yearbooks to accompany the encyclopedia?

    Yes     No

Where is it usually kept?

How often do you use it?

How often does your child use it?

20. Do you have an almanac or fact book?      Yes      No  
If so, when was it purchased.  
Who uses it? When?  
What other sources of reading material does your child have available to locate answers to his questions--library, friends, etc.?
21. Does your child receive homework?  
Do you help him with these assignments?  
How much time do you find to work with him on these assignments per week?  
How much time do you and your husband spend providing direct help to your child in his school learning on weekdays?  
Did you help him in school learning in primary grades?  
If so, how much?  
Did you teach him to read or count or print his name before he went to school? If so, how much?
- At present:
- Primary grades:
- Preschool period:
22. Do you have any workbooks or other kinds of learning materials which you use to help your child in his learning?  
What other steps, if any, do you take to insure that your child keeps up in his school work?
23. How often do you and your husband discuss your child's progress in school? What generally results from such discussions?

24. Have you had any experience in teaching? What?  
Your husband?
25. When does your child usually eat dinner on week-  
days?  
Who eats with him?  
Who does most of the talking at the dinner table?  
About what?
26. At what other times are you together as a family  
on weekdays?  
What are some of the things you do together at  
these times?
27. What are some of the activities your husband  
engages in with the child on weekdays? On week-  
ends?
- On weekdays:
- On weekends:
28. Are there any adults outside of you and your  
husband that your child is particularly friendly  
with?  
If so, what does he seem to like about them?  
What do you see as this person's special  
qualities?  
How often does your child see them?  
What does he do when he's with them?
29. Did any other adults live with you when your child  
was young? If so, who?  
How long did they live with you?  
What was the age of the child when they left?  
(Note: If the child was close to them, ask the  
following questions.)  
How much schooling did they have? How would you  
rate their use of language?

30. Did you have a job outside the home when your child was younger?  Yes  No  
If so, who took care of the child?
31. Did you read books to him when he was younger? If so, when did you start? When did you stop? How regularly did you read to him? Do you still read to him?  
Does he read to you? How often?
32. About how many hours a week does he usually watch TV?  
Winter:  hours  
Summer:  hours  
What are his favorite programs?  
Do you approve of them?  
If not, what do you do about them?
33. What are your favorite TV programs?  
Did you recommend that your child watch any particular programs in the past week?  
If so, which ones?  
Did you discuss any programs with him after watching them?
34. How would you describe your child's language usage?  
Do you help him to increase his vocabulary?  
If so, how?  
How have you helped him to acquire appropriate use of words and sentences?  
Are you still helping him in these respects?  
If so, how?
35. How much would you estimate you correct him in his speech? ex. use of "ain't," etc.  
How particular are you about your child's speech?  
Are there particular speech habits of his that you

are working on to improve? Earlier?  
Give examples, if so.

36. Do you speak any language other than English in the home? Yes No. If so, which one?  
Does the child also speak this language?

37. How much schooling do you wish your child to receive?

38. How much schooling do you expect your child to receive?

39. What is the minimum level of education that you think your child must receive?

40. Do you have any ideas about the kind of work you would like to see your child do when he grows up?

Do you have any ideas about the kind of work you would not like your child to do?

41. How does your husband feel about the kind of work he's doing?

Is this the kind of work he always wanted to do?

42. How do you feel, in general, about the accomplishments of your family?

How far have you been able to accomplish the aspirations or plans with which both of you started your family life?

43. How important has education been in achieving these goals?  
How much importance is education going to have in the life of your child?  
Would his future status be radically affected if he does not attain the level of education you wish him to attain?
44. What is the educational level of some of your close friends and relatives?
45. Do any of their children go to college or have they?  
Are there any who did not attend college?  
Are there any who did not complete high school?
46. Have you met with your child's present teacher?  
Yes No  
If so, when? Why?  
Does the teacher usually initiate parent-teacher conferences?  
If you ask for a meeting, for what purpose?  
What other ways, if any, are you in contact with the school?
47. Do you know your child's best friends in the neighborhood and school?  
Do you approve of them?  
How would you rate these children in their studies?  
Do you help your child in choosing his friends?  
If so, how?
48. Do you have your child read biographies of great people? If so, whose? Has he read any biographies in the past two months? If so, whose?



49. Did you hug, kiss or speak approvingly to your child in the past few days? If so, for what reasons?  
What are some of the activities and accomplishments of your child that you praise and approve of?  
How do you do this?  
What things do you find you have to scold him for?
50. Have you thought about what kind of high school program you want your child to enroll in?  Yes  
 No.  
If so, which one? Why?
51. How often does the school give out report cards?  
Who usually signs it?  Mother  Father  
Do both parents see it?  In what ways do you use the report card?
52. Do you discuss his school grades with him?  
What particular things do you discuss with him?
53. Do you have college plans for him?  Yes  No  
If so, what have you done to financially prepare for this?  
In what other ways, if any, do you prepare him for the attainment of educational goals? (e.g., acquaint him with colleges, telling him about what people learn in college, etc.).
54. About how often do you ask your child how well he is doing in school?  
What particular things do you ask him?
55. Do you know what textbooks he uses in different subjects in school?

- Yes, all  
 Yes, some  
 No

Do you know at the beginning of the school year what things he will be studying during the year in each subject? If so, how do you find this out? (Note: get specific topics, not subjects, e.g., reading.)

56. How much time do you think a child in fifth grade should devote to his studies outside of school each day?
57. Is there any regular amount of time you have your child study each day? How regularly is it followed.
58. Does he help you in the routine housework?  Yes  
 No  
 If so, what responsibilities does he have?  
 How punctually does he carry them out?
59. Is the housework distributed among the members of the family?  
 If so, who did the planning for such assignments?  
 How regularly are these assignments followed?  
 What factors, if any, come in the way of carrying out such plans?
60. How would you rate your child's habit of completing his work on time, not leaving a problem undone, correcting his mistakes, etc.?  
 How did he acquire these habits?
61. Do you ever have to change your own plans for the sake of your child's school work?  Yes  No  
 If so, what kinds of plans have you had to change?

62. Have you had to sacrifice any of your major needs or desires such as buying a new car, giving up a job, etc., for the present and/or future education of your child? If so, what did you give up? What were the immediate consequences?

63. Are you taking any courses or involved in a hobby? If so, what?  
How did you get involved in this? How are you doing it--formally or informally?  
Did you study any subjects or have a hobby during the past two years? If so, what?

Mother:

Father:

APPENDIX B

RATING SCALES

## APPENDIX B

### RATING SCALES

There are twenty-one rating scales in all, as given in this appendix. Each rating scale is preceded by the name of the environmental process characteristic, the criteria for its measurement, and the serial numbers of the questions in the interview schedule that are based on the characteristic. The interview schedule given in Appendix A may be consulted for the questions.

The descriptions of the alternative points on the scale given as cues to the rater had to be as brief and explicit as possible for their practical use. Therefore, they are often stated in the form of phrases or incomplete and abridged sentences. Their meaning, however, will become explicit when read in the context of the other parts of the scales and the criteria for the measurement of the process characteristic concerned.

## 1a. PARENTAL ASPIRATIONS FOR THE EDUCATION OF THE CHILD

Criteria: \*Nature of the educational and vocation goals  
\*Level of expectation of the educational accomplishments

Questions: 4, 5, 37, 38, 39, 40, 43

Rating Scale:

- 9 Beyond four years of college. Occupational expectation requiring very high education. Expectation of best grades in school.
- 8
- 7 Four years of college. Occupational expectation requiring high education. Expectation of A's with some B's.
- 6
- 5 At least through high school. Some college education desired. Moderately high occupational aspiration. Expectation of B's with some A's and some C's.
- 4
- 3 Only up to high school. Very moderate and uncertain occupational expectation. Expected grades C's with some B's.
- 2
- 1 Absence of any long term educational and vocational goals. Only narrow and immediate goals. No expectations about grades, or expectation below C's.

## 1b. PARENTS' OWN ASPIRATIONS

Criteria: \*Present accomplishments  
\*Means of the accomplishments  
\*Future aspirations

Questions: 40, 41, 42, 43

Rating Scale:

- 9 Very high accomplishments already attained. Education used as in the most important means of the accomplishments, or a very keen feeling for not having enough education. Still very high aspirations.
- 8
- 7 High accomplishments already attained. Education used as one of the chief means of the accomplishment, or a keen feeling for not having enough education. Still high aspirations.
- 6
- 5 Fairly high accomplishments already achieved. Education used as one of the chief means of the accomplishments, or a keen feeling for not having enough education. Still more, but moderate aspirations.
- 4
- 3 Moderate accomplishments. Education played only an incidental role in the accomplishments. Very moderate aspirations.
- 2
- 1 Little accomplishments. Education is not considered as a means of any possible accomplishments. Practically no future aspirations.

## 1c. PARENTS' INTEREST IN ACADEMIC ACHIEVEMENT

Criteria: \*Extent of participation in the educational activities (e.g., reading, PTA)  
\*Keeness for the educational progress of the child

Questions: 6, 7, 23, 24, 46

Rating Scale:

- 9 Both parents very active in educational organizations and activities. Very particular about the educational progress of the child.
- 8
- 7 Both or any one of the parents active in educational organizations and activities. Particular about the educational progress of the child.
- 6
- 5 Only one of the parents occasionally active in educational organizations and activities. Fairly particular about the educational progress of the child.
- 4
- 3 Only one of the parents occasionally active in educational organizations and activities. Not quite particular about the educational progress of the child.
- 2
- 1 None of the parents active in any educational organization or activity. Not at all particular about the educational progress of the child.



## 1d. SOCIAL PRESS FOR ACADEMIC ACHIEVEMENT

Criteria: \*Education of the close relatives, parents,  
                  friends, and neighbors  
                  \*Education of their children

Questions: 44, 45

Rating Scale:

- 9 All or most having four years of college and beyond. Their children of college age are in college.
- 8
- 7 Most having some college education. Many have finished all the four years. Most of their children of college age are in college.
- 6
- 5 Some having high school completed or above, and some having high school not completed. Some of their children of college age are in college.
- 4
- 3 Many having high school not completed. Most of their children of college age are not in college. Some have dropped out before completing high school.
- 2
- 1 Hardly any having high school completed. Their children of college age are not in college. Most of them have dropped out before completing high school.

## 1e. STANDARDS OF REWARD FOR EDUCATIONAL ATTAINMENT

Criteria: \*Valuing academic accomplishments  
\*Selection of gifts having educational value

Questions: 4, 13, 49, 52

Rating Scale:

- 9 Academic accomplishments very highly and invariably praised. They are praised more than any other accomplishments. Very high expectations of educational achievement. Selection of gifts invariably having educational value.
- 8
- 7 Academic accomplishments are one of the most highly praised accomplishments. High expectations of educational achievement. Gifts very often having educational value.
- 6
- 5 Academic accomplishments are praised. Some other accomplishments are praised more. Moderately high expectations for educational achievement. Some gifts having educational value.
- 4
- 3 Academic accomplishments are occasionally praised. Some other accomplishments are praised highly. Moderate expectations of educational achievement. Gifts having educational value chosen only occasionally.
- 2
- 1 Academic accomplishments are not praised at all. Some other accomplishments are very highly praised. Very low expectations of educational achievement. Gifts hardly having any educational value.

## 1f. KNOWLEDGE OF THE EDUCATIONAL PROGRESS OF THE CHILD

Criteria: \*Extent of knowledge of the child's educational progress  
 \*Extent of knowledge of the textbooks used by the child and his courses of study.

Questions: 2, 3, 51, 54, 55

Rating Scale:

- 9 Detailed and up-to-date knowledge about the daily progress of the child in the school. Knowledge about the specific topics being studied or recently completed by the child in different subjects. Good acquaintance with all the textbooks used by the child.
- 8
- 7 Detailed knowledge about the daily progress of the child in the school. Knowledge about the general topics covered or being covered. Acquaintance with some of the textbooks.
- 6
- 5 General idea about the child's school progress in terms of subjectwise grades. Knowledge of the general topics covered in some of the subjects. Acquaintance with one or two textbooks.
- 4
- 3 Some gross idea about the child's school progress in terms of general grades. Knowledge of the subjects studied but not the topics. No acquaintance with textbooks.
- 2
- 1 No knowledge of the child's school progress. No knowledge of the textbooks or topics of study.

1g. PREPARATION AND PLANNING FOR THE ATTAINMENT OF EDUCATIONAL GOALS

Criteria: \*Financial preparation  
\*Academic and mental preparation (e.g., emphasizing good grades as preparation for higher learning, selecting bright children as friends)

Questions: 46, 47, 48, 50, 52, 53, 62

Rating Scale:

- 9            Sound financial preparation. Also academic and mental preparation for higher learning.
- 8
- 7            A good financial preparation, or achievement of best grades in the hope of getting good scholarships for higher learning. Also fairly good academic and mental preparation for higher learning.
- 6
- 5            Moderate financial preparation, or a desire to do it but not yet done. Some efforts toward academic and mental preparation for higher learning.
- 4
- 3            Only incidental preparation. No definite plans made yet. Moderately high educational goals. However, the parents are aware of the need for doing financial and other preparation to reach the goals.
- 2
- 1            No financial or other preparation. Absence of any higher educational goals.

## 2a. QUALITY OF THE LANGUAGE USAGE OF THE PARENTS

Criteria: \*Fluency of expression  
\*Pronunciation  
\*Vocabulary  
\*Organization of thoughts

Evidences: From the conversation with the mother during the interview.

Rating Scale:

(i) To rate each of the four criteria individually on the following scale,  
and (ii) to take their average as the overall rating for this characteristic.

9	Excellent
8	Very good
7	Good
6	A little above average
5	Average
4	A little below average
3	Quite below average
2	Poor
1	Very poor

2b. OPPORTUNITIES FOR THE ENLARGEMENT AND USE OF VOCABULARY  
AND SENTENCE PATTERNS

Criteria: \*Variety of opportunities (e.g., books, TV,  
travel, picnics, verbal interaction in home  
situations)  
\*Frequency of opportunities

Questions: 7, 9, 25, 26, 27, 28, 29, 30, 34, 36

Rating Scale:

- |   |  |
|---|--|
| 9 | A great variety of situations available frequently and consistently. |
| 8 |  |
| 7 | A good variety of situations available quite frequently.             |
| 6 |  |
| 5 | A moderate variety of situations available fairly frequently.        |
| 4 |  |
| 3 | Only a few situations available infrequently.                        |
| 2 |  |
| 1 | Very limited situations available.                                   |

2c. KEENNESS OF THE PARENTS FOR CORRECT AND EFFECTIVE  
LANGUAGE USAGE

Criteria: \*Regularity in reading to the child during pre-school period  
\*Variety of efforts for increasing vocabulary, and correcting language usage, if needed.

Questions: 14, 18, 31, 34, 35

Rating Scale:

- 9 Read to the child very regularly, almost every day, from early childhood until he began reading himself. Some special reading to him still continues. The child is encouraged to read some special material to the parents and others. A great variety of efforts in increasing vocabulary and improving language usage.
- 8
- 7 Read to the child quite regularly, almost every day, for about three years or more before he began to read himself. Some occasional reading to him still continues. A good variety of efforts in improving his vocabulary and language usage.
- 6
- 5 Read to the child fairly regularly for two or three times a week for about two years or so. Some effort to improve vocabulary and language usage still continues.
- 4
- 3 Read to the child during the pre-school period occasionally and without any regularity. Incidental efforts to improve vocabulary and language usage.
- 2
- 1 Not read to the child with any regularity at any time. Hardly any efforts to improve vocabulary and language usage.

3a. AVAILABILITY OF GUIDANCE ON MATTERS RELATING TO SCHOOL WORK

Criteria: \*Extent of general supervision regarding school work  
\*Readiness in guidance when asked for  
\*Suggestions regarding school work

Questions: 21, 22, 52, 54, 55, 57

Rating Scales:

- 9 Very regular general supervision regarding school work. Guidance made readily available when asked for. Suggestions given to the child regularly regarding the betterment of school work at the parents' initiative. Both parents provide the guidance and suggestions.
- 8
- 7 Regular general supervision regarding school work. Guidance available most of the times when asked for. Suggestions given to the child sometimes, regarding the betterment of school work, at the parents' initiative. Both parents provide the guidance and suggestions.
- 6
- 5 Fairly regular supervision regarding school work. Guidance sometimes available. Suggestions given to the child regarding the betterment of the work, only occasionally. Only one of the parents provides guidance and suggestions.
- 4
- 3 Occasional supervision regarding school work. Guidance only occasionally available. Suggestions given to the child regarding the betterment of the work very occasionally.
- 2
- 1 No supervision regarding school work. No guidance or suggestions available for the improvement of school work.



## 3b. QUALITY OF GUIDANCE ON MATTERS RELATING TO SCHOOL WORK

Criteria: \*Relevance to the specific educational needs of the child  
\*Consistency  
\*Competence

Questions: 2, 3, 16, 21, 22, 23, 24

Rating Scale:

- 9 Consistent guidance and suggestions based on the knowledge of the specific strengths and weaknesses of the child in different school subjects. Consistent guidance and preparation during pre-school and early school years. Both parents very competent to give guidance.
- 8
- 7 Guidance based on the specific needs of the child for a certain interval. Consistent educational preparation and guidance during pre-school and early school years. One of the parents very competent to give guidance.
- 6
- 5 Guidance based on the general deficiency. Some preparation for school learning during pre-school period. More guidance in early school years. One of the parents fairly competent to give guidance.
- 4
- 3 Lack of clarity about the specific needs of the child. Some vague directions regarding school work on occasions. One of the parents only moderately competent to give guidance.
- 2
- 1 No guidance. No knowledge of the child's needs in scholastic progress. Little competence to give guidance.

3c. AVAILABILITY AND USE OF MATERIALS AND FACILITIES RELATED TO SCHOOL LEARNING

Criteria: \*Selection of the material (e.g. Dictionary, Encyclopedia, Workbooks)  
\*Guidance for the use of the material and educational facilities

Questions: 11, 17, 18, 19, 20, 22

Rating Scale:

- 9 Selection of the most appropriate materials according to the educational level of the child. Abundant supply of the educational material. Appropriate and timely guidance for the use of the materials and facilities.
- 8
- 7 Selection of generally appropriate material according to the educational level of the child. Fairly abundant supply of the educational material. Appropriate and timely guidance for the use of the materials and facilities.
- 6
- 5 Availability of some educational material. Specific selection according to the child's level only in some cases. Some general guidance for the use of the materials and facilities.
- 4
- 3 Very moderate supply of educational material. No specific selection according to the child's level. Only occasional guidance for the use of the material and facilities.
- 2
- 1 No availability of education material in the home. No use of facilities available in the community, such as library.

4a. THE EXTENT AND CONTENT OF INDOOR ACTIVITIES OF THE FAMILY

Criteria: \*Variety (Discussion, Undertaking a project, etc.)  
\*Frequency  
\*Educational value

Questions: 7, 10, 26, 27

Rating Scale:

- 9 A variety of activities in the home, having very high educational value are frequently undertaken by the family. Both parents participate.
- 8
- 7 A variety of activities in the home, having high educational value are often undertaken by the family. One or both parents participate.
- 6
- 5 A moderate variety of activities in the home, having general educational value are sometimes undertaken by the family. One or both parents participate.
- 4
- 3 Only a very few number of family activities in the home have direct educational value. Often only one parent participates.
- 2
- 1 No family activities in the home. Or, the activities have hardly any direct educational value. Both parents are generally not available in any educational activities.

4b. THE EXTENT AND CONTENT OF OUTDOOR ACTIVITIES DURING WEEKENDS AND VACATIONS

Criteria: \*Variety (e.g., visits to a museum or a zoo, traveling to historical places)  
\*Frequency  
\*Educational value

Questions: 6, 7, 8, 9, 27

Rating Scale:

- 9 A variety of child-centered activities outside the home having very high educational value, and frequently undertaken by the family. Both parents participate. Initiated and planned by different members of the family, instead of just one person.
- 8
- 7 A variety of outside activities having high educational value are often undertaken by the family. One or both parents participate. Generally planned by the parents.
- 6
- 5 A moderate variety of outside activities that have high educational value. Such activities are only sometimes undertaken by the family. One or both parents participate. Generally planned by any one of the parents.
- 4
- 3 A majority of outside activities have more recreational or other purposes, with incidental emotional value. Or, very few outdoor activities. One or both parents participate. Generally planned by any one of the parents. Others follow.
- 2
- 1 Practically no outside activities of the family having educational purpose.

## 4c. USE OF TV AND SUCH OTHER MEDIA

Criteria: \*Purpose of the use  
\*Extent of the use

Questions: 32, 33

Rating Scale:

- 9 Regular use for specifically educational purpose. Recreational value subsidiary. Frequent follow-up discussions.
- 8
- 7 Regular use for general educational and recreational purposes. Sometimes follow-up discussions.
- 6
- 5 Fairly regular use. Recreational purpose often more predominant than educational purpose. Occasionally follow-up discussions.
- 4
- 3 Not much use of TV and other media. Mostly recreational purpose when used. Hardly any follow-up discussions.
- 2
- 1 No use of any of these media.

4d. USE OF BOOKS, PERIODICAL LITERATURE, LIBRARY AND SUCH OTHER FACILITIES

Criteria: \*Variety of material used by the family members (e.g., books, magazines, newspapers)  
\*Encouragement to the child for the use of such material (e.g., helping him to be a member of the library, suggesting him to trade reading material with friends)

Questions: 7, 10, 14, 31

Rating Scale:

- 9 Extensive reading of a variety of material by the family members. Great encouragement to the child for the same from his early age--even before he learned to read.
- 8
- 7 Fairly extensive reading of a good variety of material by the family members. Encouragement to the child for the same ever since he learned to read.
- 6
- 5 Moderate reading of some variety of material by the family members. Some encouragement to the child for the use of reading facilities--only lately.
- 4
- 3 Some reading infrequently done by the members of the family. Only occasional encouragement to the child for the use of reading facilities.
- 2
- 1 Hardly any reading done by the members of the family. No encouragement to the child also.

5a. NATURE AND QUALITY OF TOYS, GAMES, AND HOBBIES MADE  
AVAILABLE TO THE CHILD

Criteria: \*Thought-provoking element in the toys, etc.  
\*Variety

Questions: 12, 13

Rating Scale:

- 9 A large variety of thought-provoking and educational toys, games, etc., provided to the child since early childhood. Great encouragement for the development of educationally oriented hobbies.
- 8
- 7 A fairly good variety of thought-provoking and educational toys, games, etc., provided to the child since early childhood. Some encouragement for the development of educationally oriented hobbies.
- 6
- 5 Some thought-provoking and educational toys, games, etc., available. No educationally oriented hobbies.
- 4
- 3 Only a few thought-provoking and educational toys, games, etc., available. No educationally oriented hobbies.
- 2
- 1 Hardly any thought-provoking and educational toys, games, etc., available. No educationally oriented hobbies.

5b. OPPORTUNITIES FOR THINKING AND IMAGINATION IN DAILY ACTIVITIES

Criteria: \*Variety (e.g., use of power appliances, thought-provoking discussions, etc.)  
 \*Level of complexity  
 \*Extent of encouragement for independent thinking

Questions: 7, 15, 16, 25

Rating Scale:

- Opportunities to work with a variety of complex appliances. Opportunities to listen to and participate in thought-provoking discussions. Great encouragement for independent thinking.
- 8
- 7 Opportunities to work with some variety of complex appliances. Some opportunities to listen to and participate in thought-provoking discussions. Some encouragement for independent thinking.
- 6
- 5 Opportunities to work with a few moderately complex appliances. Some opportunities to listen to thought-provoking discussions. Some encouragement for independent thinking.
- 4
- 3 Opportunities to work with one or two very moderately complex appliances. Opportunities to listen to thought-provoking discussions only occasionally. Hardly any encouragement for independent thinking.
- 2
- 1 Practically no opportunities to work with any complex appliances. No opportunities to listen to any thought-provoking discussions. No encouragement for independent thinking.



## 6a. DEGREE OF STRUCTURE AND ROUTINE IN THE HOME MANAGEMENT

Criteria: \*Planning and distribution of work  
\*Punctuality in following it

Questions: 57, 58, 59, 60

Rating Scale:

- |   |   |
|---|---|
| 9 | Well planned home management. Distribution of work among the family members. Punctuality and discipline in following the plans. |
| 8 |   |
| 7 | Major duties distributed among the family members. Planning followed quite consistently.  |
| 6 |   |
| 5 | Moderate planning. It is followed with only moderate regularity.  |
| 4 |   |
| 3 | Some efforts made for planning and distribution of work which was not followed systematically.                                  |
| 2 |   |
| 1 | No planning of household work.  |

6b. PREFERENCE FOR THE EDUCATIONAL ACTIVITIES OVER OTHER PLEASURABLE THINGS

Criteria: \*Priority to educational activities attached by the parents  
\*Continuity of academic activities (e.g., taking courses after completing formal education)

Questions: 53, 56, 57, 61, 62, 63

Rating Scale:

- 9 Verh high priority attached by the parents to studies and other educational activities. Great encouragement to sacrifice pleasurable activities for completing school work. Both parents continued studies voluntarily after completing formal education.
- 8
- 7 Educational activities and studies stand among the activities of high priority. Encouragement to complete school work before undertaking other activities. One or both parents continued studies voluntarily after completing formal education.
- 6
- 5 Educational activities and studies moderately high in priority. A few others higher in priority. One of the parents continued studies either voluntarily or as occupational requirement after completing formal education.
- 4
- 3 Other activities higher in priority than educational activities and studies. No specific habit formation of completing school work before undertaking other activities emphasized. One of the parents continued studies after completing formal education as an occupational requirement.
- 2
- 1 No emphasis attached to scholastic studies by the parents. It is often made subsidiary to other activities. Parents did not continue any studies after completing their formal education.



FAMILY DATA FORM:

Child's Name: \_\_\_\_\_ DOB: \_\_\_\_\_ GRADE: \_\_\_\_\_

Mother: \_\_\_\_\_ AGE: \_\_\_\_\_ OCCUPATION: \_\_\_\_\_

Father: \_\_\_\_\_ AGE: \_\_\_\_\_ OCCUPATION: \_\_\_\_\_

Place of Birth: \_\_\_\_\_  
FATHER MOTHER

(If appropriate) How long in the U.S.? \_\_\_\_\_

Educational level: Mother \_\_\_\_\_

Father \_\_\_\_\_

Education in Mexico: Mother \_\_\_\_\_

Father \_\_\_\_\_

How long in the Present Home?

Where did you live before?

Why did you choose this home?

Why did you choose this community:

Name of Interviewee: \_\_\_\_\_ MOTHER FATHER OTHER \_\_\_\_\_

Address: \_\_\_\_\_

Phone # \_\_\_\_\_

Name of Interviewer: \_\_\_\_\_

Name of Interview: \_\_\_\_\_

QUESTIONARIO FAMILIAR

EDAD SEXO GRADO ESCUELA

1. Cuantos niños tiene? \_\_\_\_\_

	EDAD	SEXO	GRADO	ESCUELA
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Vamos a platicar sobre \_\_\_\_\_

Podremos referirnos a sus otros hijos en ocasión, pero mis preguntas se refieren principalmente a cerca de su hija \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Como vá en la escuela? \_\_\_\_\_

Que notas recibe regularmente? \_\_\_\_\_

En que son sus mejores notas? Sus peores? \_\_\_\_\_

3. En que área de estudio ha mejorado este año? \_\_\_\_\_

En cual no ha demostrado suficiente progreso? \_\_\_\_\_

4. Ud. que opina del progreso que su niña está haciendo en la escuela? \_\_\_\_\_

\_\_\_\_\_

¿ Que notas/grados Ud. piensa que recibirá? \_\_\_\_\_

\_\_\_\_\_

¿ Que notas/grados le parecerían aceptables a Ud? \_\_\_\_\_

\_\_\_\_\_

Expectativa

Aceptable

5. ¿ Como les vá en la escuela a sus otros hijos?

6. ¿ A qué organizaciones o clubes pertenece su familia,  
(PTA; Religiosa; Política, etc.)?

¿ Entiende su hija lo que se hace en esas organiza-  
ciones? Si \_\_\_\_\_ No \_\_\_\_\_

¿ Cómo? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. ¿ Cual es su modo favorito de recreación?

¿ Y el de su esposo?

¿ Qué tipo de actividades recreativas hacen durante el  
fin de semana (mirar TV; visitar con familiares; ir  
al parque; cocinar; ir al club; ir a la iglesia . .)?

¿ Qué lugares han visitado durante los fines de semana  
en los últimos seis meses?,

¿ Porqué razon?

8. c Planean generalmente los fines de semana y las vacaciones con anticipación?  
Si \_\_\_\_\_ No \_\_\_\_\_
- c Con que frecuencia? \_\_\_\_\_
- c Quien hace los planes? \_\_\_\_\_
9. c Donde han viajado como familia durante los dos últimos años?
- c Como eligieron esos lugares? .
- c Que tipo de actividades realizaron una vez allí?
10. c Que periódicos/diarios o revistas compran?
- c Ud. trata de que su niña los lea? c Como?
- c La niña participa en vez de nada mas que escuchar?
11. c Recibe su hija lecciones de música, baile . . . ?  
\_\_\_\_\_
- c Cuanto hace que comenzo?
- c Como su interesó por eso?

12. c Que tipo de intereses tiene su niña (hobbies)?

c Cuanto hace que está interesada en ello?

c Cómo fué que se intereso en primer lugar?  
(Note parent initiation)

13. c Que tipos de juguetes, juegos, libros o revistas,  
(etc) le ha comprado Ud a su hija durante los dos  
últimos años? (incluya cumpleaños y reyes)

Por ejemplo: (lista)

14. c Su hija tiene una "library card?" Si \_\_\_ No \_\_\_

c Cuanto hace que la tiene?

c Cómo la consiguió (note Parent initiation)

c Recuerda las primeras veces que fué a la biblioteca?  
c Con quién fué?

c Que tipo de libros Ud. prefiere que ella lea?

c De que otra parte ella puede conseguir libros?



15. c Que tipo de accesorios (home appliances) le permite utilizar a su hija?

c Que edad tenia cuando comenzo?

16. c Le dá Ud. tareas escolares a su hija para que ella resuelva en casa?

Por ejemplo:

17. c Tiene su hija una mesa donde trabajar? Si \_\_\_ No \_\_\_

(Si, No), c donde estudia ella?

c Que tipo de articulos tiene para trabajar?  
 lapices \_\_\_ crayolas \_\_\_ reglas \_\_\_ otra \_\_\_  
 colores \_\_\_ papeles \_\_\_ tijeras \_\_\_

18. c Poseen un diccionario en la casa?

c Que tipo (Inglés/Español, Inglés . . . )?

c Su hija, tiene su propio diccionario?

c Donde guardan el diccionario?

c Con que frecuencia usa su hija el diccionario?

c Cuando usa su hija el diccionario - lo hace sola ó Ud. le tiene qué decir que lo haga?

c Con que frecuencia usa Ud. el diccionario?

c En que otra manera aprende su hija palabras nuevas, escuela - familiares - . . . ?

19. c Tienen una enciclopedia? Si \_\_\_ No \_\_\_  
c Que tipo - Infantil - adulto?  
c Cuanto hace que la compraron?  
c Porque la compraron?  
c Continuan recibiendo volumenes anuales? Si \_\_\_ No \_\_\_  
c Donde guardan la enciclopedia? (Within child's reach)  
c Con que frecuencia la utilizan?  
c Con que frecuencia la utiliza su hija?
20. c Tienen un almanaque o libro de hechos? Si \_\_\_ No \_\_\_  
c Cuanto hace que lo compraron?  
c Quien lo usa? c Cuando?  
c Que otros tipos de fuentes de referencia tiene su hija cuando esta buscando alguna respuesta - biblioteca publica, familiares . . . ?
21. c La escuela le da trabajo para hacer en casa?  
c Ud. le ayuda a su hija con sus trabajos escolares?  
c Cuanto tiempo, por semana, le ayuda a su hija con sus tareas escolares en la casa?  
c Cuanto tiempo, durante el fin de semana, dedican Ud. y su esposo para trabajar con su hija en tareas escolares?  
c La ayudaron cuando comenzo la escuela?  
c Le enseñaron a leer, contar, o escribir su nombre antes que comenzara la escuela?

22. c Tiene Ud. libros de trabajos, o algun tipo de material educacional que Ud. usa para enseñarle a sus hijos?
- c Que medidas ha tomado para asegurarse que su hija hace sus tareas escolares?
23. c Con que frecuencia Ud. y su esposo platican sobre el progreso que la nina esta realizando en la escuela?
- c Cuales son los resultados de estas discusiones?
24. c A tenido alguna mala experiencia cuando trato de enseñarle algo a su nina?
- c Que sucedio?
- c Y su esposo?
25. c A que hora cena su hija durante la semana?
- c Con quien come?
- c Quien es el que platica mas durante la cena?
- c De que platican durante la cena? (en general)
26. c A que otras horas del dia estan juntos como familia?
- c Cuales son algunas de las cosas que hacen juntos en esos momentos?
27. c Que tipo de actividades realiza el padre con los ninos durante la semana?
- c Durante el fin de semana?

28. c A parte de Ud. y de su esposo, c Tiene el nina otros familiares con los cuales es amistosa?  
c Que es lo que ella aprecia en ellos?  
c Cuales son las cualidades que Ud. ve en ellos?  
c Con que frecuencia los visita su nina?  
c Que tipo de actividades hacen cuando se visitan?
29. c Cuando la nina era pequena, vivio con algun familiar?  
\_\_\_\_\_ Quien?  
c Por cuanto tiempo?  
c Que edad tenia cuando el familiar no vivia mas con Uda. (o cuando la nina volvio con Ud.)?  
c Cuanta educacion tenia su familiar?  
c Le platicaba mucho a la nina?
30. c Ud. trabajaba cuando la nin era chiquita?  
c Quien la cuidaba cuando Ud. iba al trabajo?
31. c A Ud. le quedaba tiempo para leerle libros a la nina cuando era chiquita?  
c De vez en cuando, a menudo, todos los dias?  
c Cuando dejo de hacerlo?  
c Todavia le lee libros?  
c Ella le lee libros a Ud.? c Con que frecuencia?
32. c Aproximadamente cuantos horas de television mira la nina?  
Invierno \_\_\_\_\_ horas Verano \_\_\_\_\_ horas

- c Cuales son sus programas favoritos?  
c Ud. esta de acuerdo con ellos?  
c Si no, como trata de que nos los mire?
33. c Cuales son sus programas favoritos?  
c Ud. le ha recomendado a su nina que mire algun programa especial esta semana?  
c Cual?  
c Platican sobre los programas despues de mirarlos?
34. c A Ud. como le parece que habla su nina?  
c Ud. le ayuda a que aprenda usar palabras nuevas?  
c Como?  
c Como la corrige, o le ensena a que hable bien?  
c Todavia la ayuda?                      c Como?
35. c Le tiene que corregir el modo que habla constantemente?  
c nunca?                                      c a veces?  
c Ud. le exige a la nina que hable correctamente?  
c a veces?                                      c nunca?                                      c constantemente?  
c Hay alguna expresion que ella usa que a Ud. le molesta?
36. c Platican alguna otra lengua en la casa?  
c Cual?

- c La nina tambien la habla? Solo la entiende?
37. c Cuanta educacion le gustaria que su hija reciba?
38. c Cuanta educacion le parece que va a recibir?
39. c Cuanta educacion le parece a Ud. que es el minimo que debe recibir?
40. c Tiene alguna idea del tipo de trabajo que le gustaria que su nina realice cuando sea mayor?
- c Que tipo de tarea Ud. preferiria que su hija no hiciera cuando sea mayor?
41. c Su esposo que piensa del trabajo que hace?
- c Es el tipo de trabajo que el queria hacer?
42. c Ud. que piensa, en general, de lo que han logrado hasta ahora como familia?
- c Cuanto han podido lograr hasta ahora de las aspiraciones que tenian cuando comenzaron su familia?
43. c Que importancia va a tener la educacion en la vida de su nina?
- c Le parece que su futuro va a ser diferente, si ella no obtiene el nivel de educacion que Ud. le desea?
44. c Hasta que grado pudieron estudiar Ud., sus familiares y amigos?

45. c Alguno de sus familiares o amigos tiene hijos en el colegio (college)?
- c Tienen hijos que no completaron la secundaria?
46. c Ud. conoce a la maestra(o) de su nina? Si \_\_\_\_\_ No \_\_\_\_\_
- c Cuando la conocio?
- c Por lo general, es la maestra la que decide platicar con Ud.?
- c A pedido junta con la maestra alguna vez?
- c Con que proposito?
- c De que otro manera mantiene Ud. contacto con la escuela?
47. c Ud. conoce los amigos de su nina en la escuela y el barrio?
- c Ud. aprueba de estas amistades?
- c Son ninas(os) estudiosos?
- c Ud. le ayuda a su nina a elegir sus amigas?
- c Como?
48. c Ud. le cuenta o le hace leer sobre la vida de personas importantes? Quienes (deportes, cine, ciencias, arte, patrioticas, religiosas)?
49. c En los ultimos dia se sintio especialmente orgullosa de su nina?
- c Como expresa su orgullo (la abraza, besa, le cuenta como la hace sentir . . . )?
- c Cuales son algunas de las actividades de su nina de la Ud. esta particularmente orgullosa?

c Por que razones tiene que retarla?

50. c A pensado en que tipo de programa secundario le gustaria enrolar a su hija? Si \_\_\_\_\_ No \_\_\_\_\_

c Cual?

51. c Con que frecuencia le envian la tarjeta de calificaciones?

c Quien la firma, Padre \_\_\_\_\_ Madre \_\_\_\_\_?

c La miran los dos?

c Como usan esa informacion?

52. c Platican con la nina sobre su progreso escolar?

c Que cosas en particular?

53. c Les gustaria que fuera al colegio (college)?  
Si \_\_\_\_\_ No \_\_\_\_\_

c En que modo tratan de interesarla (le muestran el colegio, le platican de lo que podria aprender, el dinero que podria ganar . . . ?

c Economicamente, les resultaria dificil ponerla en el colegio?

54. c Con que frecuencia platica con su nina sobre su progreso escolar?

c Que tipo de cosas le pregunta?



55. c Conoce Ud. los libros que su nina utiliza en la escuela?

Si \_\_\_\_\_ todos  
Si \_\_\_\_\_ algunos  
Si \_\_\_\_\_

c Uds sabe al comienzo del ano cuales son las cosas que va a estudiar en aritmetica o lectura?

c Como se entera?

56. c Cuanto tiempo, a Ud. le parece, que la nina debe dedicarse a estudiar en casa?

57. c Tiene la nina un horario de estudios diario?  
c Es regular (consistent)?

58. c Le ayuda con las tareas domesticas? Si \_\_\_\_\_ No \_\_\_\_\_

c Que responsabilidades tiene?

c Se acuerdo sola o tiene que ayudarla?

59. c Se distribuyen las tareas domesticas entre hermanos y hermanas?

c Quien las distribuye?

c Con que regularidad se llevan a cabo?

60. c Como considera el estilo de su hija para completar tareas a tiempo, dejar cosas sin terminar, corregir sus errores, etc.?

c Como aprendio a ser asi?

61. c Tiene, a veces, que cambiar sus planes porque la nina  
tiene que estudiar? Si \_\_\_\_\_ No \_\_\_\_\_

c Por ejemplo?

62. c A tenido que sacrificar el comprar un carro mas  
nuevo, o un trabajo mejor, para mantener la situación  
educacional de su nina?

c (If so) Cual?

63. c Esta Ud. tomando algun curso, o interesada(o) en  
alguna afición (Lobby)?

c En que?

c Como es que se intereso en esto?

c Lo hace por cuenta propio o con un grupo, o clase?

c En el pasado?

c Y su esposo?

APPENDIX C

LETTER TO PARENTS

APPENDIX C

LETTER TO PARENTS

TRACY ELEMENTARY SCHOOL DISTRICT  
Tracy, California 95376

January 18, 1983

Dear Parent,

Your daughter \_\_\_\_\_ has the opportunity to participate in a study which is being conducted in our district in cooperation with the University of Pacific.

She would have to work for approximately 30 minutes to complete a drawing task and another 30 minutes to point to one of four possible answers in a second task. This activity will be followed by a phone interview of about the same duration. That would be the extent of your involvement.

Your daughter's participation in this study would constitute a genuine contribution to research in behavioral science.

I allow my daughter \_\_\_\_\_ to participate in this study.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Parent's Signature

APPENDIX D

INTERSCORER RELIABILITY COEFFICIENTS

Interscorer Reliability Coefficients for  
the Figural Tests of the TTCT

	Fluency	Flexi- bility	Origi- nality	Elabor- ation
Fluency	r= 0.79 N=61 P= 0.000			
Flexibility		r= 0.86 N=61 p=0.000		
Originality			r= 0.74 N=61 p=0.000	
Elaboration				r= 0.69 N=55 p=0.000

APPENDIX E

FREQUENCY DISTRIBUTION TABLES FOR  
EACH IEE VARIABLE

IEE Variable Achievement Press

Code	Absolute Frequency	Relative Frequency (PCT)	Adjusted Frequency (PCT)	Cum Frequency (PCT)
12	1	1.6	1.7	1.7
16	1	1.6	1.7	3.3
17	1	1.6	1.7	5.0
18	1	1.6	1.7	6.7
20	1	1.6	1.7	8.3
21	3	4.9	5.0	13.3
22	2	3.3	3.3	16.7
24	4	6.6	6.7	23.3
25	4	6.6	6.7	30.0
26	2	3.3	3.3	33.3
27	4	6.6	6.7	40.0
28	9	14.8	15.0	55.0*
30	1	1.6	1.7	56.7
31	2	3.3	3.3	60.0
32	2	3.3	3.3	63.3
33	7	11.5	11.7	75.0
34	2	3.3	3.3	78.3
36	1	1.6	1.7	80.0
38	2	3.3	3.3	83.3
43	1	1.6	1.7	85.0
44	1	1.6	1.7	86.7
46	2	3.3	3.3	90.0
47	2	3.3	3.3	93.3
50	2	3.3	3.3	96.7
52	1	1.6	1.7	98.3
53	1	1.6	1.7	100.0
0	1	1.6	Missing	100.0
Total	61	100.0	100.0	



## IEE Variable Language Models

<u>Code</u>	<u>Absolute Frequency</u>	<u>Relative Frequency (PCT)</u>	<u>Adjusted Frequency (PCT)</u>	<u>Cum Frequency (PCT)</u>
6	2	3.3	3.3	3.3
8	3	4.9	5.0	8.3
9	2	3.3	3.3	11.7
10	16	26.2	26.7	38.3
11	14	23.0	23.3	61.7*
12	6	9.8	10.0	71.7
13	3	4.9	5.0	76.7
14	5	8.2	8.3	85.0
15	1	1.6	1.7	86.7
16	2	3.3	3.3	90.0
17	4	6.6	6.7	96.7
21	2	3.3	3.3	100.0
0	1	1.6	Missing	100.0
<b>Total</b>	<b>61</b>	<b>100.0</b>	<b>100.0</b>	

Valid cases 60 - Missing cases 1

## IEE Variable Academic Guidance

<u>Code</u>	<u>Absolute Frequency</u>	<u>Relative Frequency (PCT)</u>	<u>Adjusted Frequency (PCT)</u>	<u>Cum Frequency (PCT)</u>
3	1	1.6	1.7	1.7
6	5	8.2	8.3	10.0
7	7	11.5	11.7	21.7
8	5	8.2	8.3	30.0
9	2	3.3	3.3	33.3
10	10	16.4	16.7	50.0*
11	5	8.2	8.3	58.3
12	5	8.2	8.3	66.7
13	5	8.2	8.3	75.0
14	1	1.6	1.7	76.7
15	1	1.6	1.7	78.3
16	3	4.9	5.0	83.3
17	2	3.3	3.3	86.7
18	1	1.6	1.7	88.3
19	1	1.6	1.7	90.0
20	1	1.6	1.7	91.7
21	1	1.6	1.7	93.3
23	2	3.3	3.3	96.7
24	2	3.3	3.3	100.0
0	1	1.6	Missing	100.0
<b>Total</b>	<b>61</b>	<b>100.0</b>	<b>100.0</b>	

Valid cases 60 - Missing cases 1

## IEE Variable Activeness of the Family

Code	Absolute Frequency	Relative Frequency (PCT)	Adjusted Frequency (PCT)	Cum Frequency (PCT)
4	1	1.6	1.7	1.7
5	1	1.6	1.7	3.3
8	1	1.6	1.7	5.0
9	4	6.6	6.7	11.7
10	6	9.8	10.0	21.7
11	3	4.9	5.0	26.7
12	8	13.1	13.3	40.0
13	12	19.7	20.0	60.0
14	2	3.3	3.3	63.3
16	4	6.6	6.7	70.0
17	5	8.2	8.3	78.3
18	2	3.3	3.3	81.7
19	1	1.6	1.7	83.3
21	3	4.9	5.0	88.3
22	2	3.3	3.3	91.7
24	4	6.6	6.7	98.3
26	1	1.6	1.7	100.0
0	1	1.6	Missing	100.0
Total	61	100.0	100.0	

Valid cases 60 - Missing cases 1

## IEE Variable Intellectuality in the Home

<u>Code</u>	<u>Absolute Frequency</u>	<u>Relative Frequency (PCT)</u>	<u>Adjusted Frequency (PCT)</u>	<u>Cum Frequency (PCT)</u>
2	1	1.6	1.7	1.7
3	3	4.9	5.0	6.7
4	2	3.3	3.3	10.0
5	10	16.4	16.7	26.7
6	12	19.7	20.0	46.7
7	10	16.4	16.7	63.3
8	4	6.6	6.7	70.0
9	5	8.2	8.3	78.3
10	6	9.8	10.0	88.3
11	4	6.6	6.7	95.0
13	1	1.6	1.7	96.7
14	2	3.3	3.3	100.0
0	1	1.6	Missing	100.0
<b>Total</b>	<b>61</b>	<b>100.0</b>	<b>100.0</b>	

Valid cases 60 - Missing cases 1

## IEE Variable Work Habits in the Home

<u>Code</u>	<u>Absolute Frequency</u>	<u>Relative Frequency (PCT)</u>	<u>Adjusted Frequency (PCT)</u>	<u>Cum Frequency (PCT)</u>
3	2	3.3	3.3	3.3
4	7	11.5	11.7	15.0
5	4	6.6	6.7	21.7
6	6	9.8	10.0	31.7
7	12	19.7	20.0	51.7
8	4	6.6	6.7	58.3
9	13	21.3	21.7	80.0
10	3	4.9	5.0	85.0
11	2	3.3	3.3	88.3
12	1	1.6	1.7	90.0
14	1	1.6	1.7	91.7
16	3	4.9	5.0	96.7
17	2	3.3	3.3	100.0
0	1	1.6	Missing	100.0
<u>Total</u>	<u>61</u>	<u>100.0</u>	<u>100.0</u>	

Valid cases 60 - Missing cases 1

APPENDIX F

FLUENCY, FLEXIBILITY, ORIGINALITY AND  
ELABORATION BY LINGUISTIC GROUP AND  
GRADE CLUSTER

Fluency, Flexibility, Originality, and Elaboration  
by Linguistic Group and Grade Cluster

Fluency

	Primary	Intermediate
SEP	52.86 (14)	68.24 (17)
LEP	57.19 (16)	65.61 (14)

Flexibility

SEP	60.00 (14)	75.74 (17)
LEP	58.59 (16)	74.64 (14)

Originality

SEP	50.00 (14)	68.24 (17)
LEP	52.66 (16)	63.89 (14)

Elaboration

SEP	31.96 (14)	47.03 (17)
LEP	30.31 (16)	42.14 (14)

All differences are significant ( $p < .001$ ).