

**EARLY INTERVENTION:  
ONE APPROACH**

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EARLY INTERVENTION:  
ONE APPROACH

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An Abstract  
Presented to  
the Graduate Council of  
Austin Peay State University

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In Partial Fulfillment of  
the Requirements for the Degree  
Master of Arts in Psychology

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by  
Carolyn Ann Cumbee

May, 1983

## ABSTRACT

This study was designed to assess the results of early intervention with infants deemed "at risk" for developmental disabilities. Data were gathered on children in already existing programs operated by the Pennyroyal Mental Health-Mental Retardation Center. Two measures were taken. The main group of 24 children involved assessment of progress in the first six months of intervention. Two groups were formed of early entry infants (less than 12 months at age of entry) and late entry infants (more than 18 months at age of entry). The late entry infants made significantly more progress in the first six months according to the Learning Accomplishment Profile (LAP) in the areas of language and cognition.

Since the main purpose of this study was to assess the results of early stimulation, a matched subgroup was formed. This subgroup was made up of late entry children who were matched at the time of their entry into a program with an early entry child. They were then each assessed on the Learning Accomplishment Profile. The developmental functioning ages of an early entry child who had been involved in a program and a late entry child who was just entering a program were compared. Dramatic differences were seen particularly in this subgroup of matched pairs. The early entry infants were functioning significantly better in cognitive tasks than the late entry infants.

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May, 1983

To the Graduate Council:

I am submitting herewith a Thesis written by Carolyn Cumbee entitled "Early Intervention: One Approach." I recommend that it be accepted as partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

Patricia F. Chappell  
Major Professor

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its acceptance:

Harland E. Blair  
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TABLE OF CONTENTS

| CHAPTER                                       | PAGE |
|---|------|
| 1. INTRODUCTION TO THE PROBLEM . . . . .      | 1    |
| 2. THE PROGRAM AND ITS PARTICIPANTS . . . . . | 7    |
| 3. METHODS . . . . .                          | 10   |
| 4. RESULTS . . . . .                          | 12   |
| 5. DISCUSSION . . . . .                       | 13   |
| BIBLIOGRAPHY . . . . .                        | 17   |
| APPENDICES . . . . .                          | 21   |
| TABLE 1 . . . . .                             | 22   |
| TABLE 2 . . . . .                             | 23   |
| TABLE 3 . . . . .                             | 24   |

LIST OF TABLES

| TABLE  | PAGE |
|--|------|
| I. Matched Pairs; Functioning Levels . . . . . | 22   |
| II. Main Group; Basic Statistics . . . . .     | 23   |
| III. Matched Pairs; Basic Statistics . . . . . | 24   |

## Chapter 1

### INTRODUCTION TO THE PROBLEM

The recent emphasis on early intervention with infants presents an innovative trend in education. Infant stimulation programs have proliferated in the last decade. This trend has followed results from studies of Head Start and other preschool enrichment programs (Clarke and Clarke, 1976; Hunt, 1979). In a governmental report by Bronfenbrenner (1975), a study of early educational intervention and the effectiveness of this approach was undertaken. From the results of this comprehensive study, it was concluded that children's gains in day preschool education programs appear to "wash out" after the program terminates. This effect appears to occur because of the plasticity of the child's developmental learning. According to Hunt (1979), a major share of early losses can be made up if the quality of enrichment improves; conversely, if the quality of enrichment decreases earlier gains can be lost. Therefore, his emphasis is upon catching the child in the critical or sensitive period to learn a skill and stimulating the skill at that time (Hunt, 1979; Scott, 1968). According to Hunt, the critical period to learn initiative, trust, compassion, curiosity and various other learning sets appears to be in the first three years of life (Hunt, 1979).

Some recommendations from Bronfenbrenner's study (1975) included beginning intervention early, and involving the mother as teacher/trainer of her infant. Then, implementation of a preschool group education approach when these children reach two to four years of age was recommended. This program should continue until entry into public

school. Thus, Bronfenbrenner concluded that intervention should begin early, should involve the mother or primary caregiver, should include preschool education, and should be part of a continuous educational process lasting through the school years (Bronfenbrenner, 1975). The Clarkes (1980) indicate that early experience by itself will not have a long term effect but its importance lies in its function as a link in the developmental chain. The significance of early experience in the first year of life on later development is that it marks the beginning of a lifelong endeavor of learning and enrichment of experiences (Clarke and Clarke, 1980).

Therefore, Bronfenbrenner's landmark report expanded interest in infant stimulation. Since that time many populations of infants have been targeted for programs of intervention with encouraging results. These programs involve culturally deprived infants (Honig, 1977), premature infants (Cornell and Gottfried, 1976; Katz, 1971), atypical and handicapped infants (Neilson, Collins, Meisel, Lowry, Engh, Johnson, 1975), Down's syndrome infants (Hayden and Dmitriev, 1975) and "at risk" populations (Beller, 1979; Derevensky, 1981; Jones, 1977; Ramey and Smith, 1976; and Ramey, Holmberg, Sparling and Collier, 1977).

This report will concentrate on a population of infants who began a stimulation program early and who can be described as "at risk" for developmental disabilities. The "at risk" category here includes atypical, handicapped, Down's syndrome, and premature infants. The infants discussed in this report have been involved in a program of intervention aimed at training parents, or primary caregivers, to stimulate the child at home on an ongoing basis.

First, let us explore the foundation for this parent-training model. This emphasis on involvement of the mother as the primary trainer and stimulator of the child includes some basic factors upon which much research has been conducted. One hypothesis in mother-infant interaction is explored in a study involving normal infants aged 9 through 18 months old (Belsky, Good, Most, 1980). In studying these mothers, the conclusion was reached that maternal efforts to focus the infants' attention on objects and events in their environment increased the infants' ability to initiate, maintain, and engage in sophisticated exploration. Thus, the mothers taught the infants to interact with their environment in a more meaningful way, which in turn enhanced the infants' learning experiences.

Another study focusing on mother-infant interactions emphasized reinforcement of desirable infant behaviors (Lewis and Goldberg, 1969). This reinforcement of infants responding to their environment not only increased the frequency of interactions, but appeared to instill in the infants the expectancy that their actions can affect their world. Thus, the infants interactions with their environment was expected to increase based on this early instillation of the belief that they could create an effect on, or control their environment. This competence motivation was first explained by White (1961). He explored a chain of events marked by stimulation, cognition, action, effect on the environment, new stimulation, etc. This effect on the environment gives the child a feeling of efficacy which perpetuates the cycle, according to White.

This motivational model is further substantiated by an additional study (Yarrow, Rubenstein, Pedersen and Jankowski, 1972). These

researchers defined motivation operationally and measured behaviors in the infant. Some of these specific behaviors include reaching persistently for objects, attempting to have an effect on and elicit responses from objects, and showing preferential attention to and manipulation of novel objects. They measured these behaviors of manipulating the environment and trying to master its elements and formulated conclusions. These conclusions involved the reinforcing and self-perpetuating cycle which is begun when the infants interact with their environment. This study substantiated the general premise that when an infant is stimulated by the mother to interact with its environment, this creates a self-perpetuating cycle in the infant to increase and improve later interactions.

Secondly, let us examine some successful early intervention programs which use this model of early involvement of infants with their mothers as primary stimulators. One such program study (Nielsen et al., 1975) involves atypical infants with handicaps of various natures. This program involves the mothers as primary stimulators in small groups. They are trained to work more effectively with their infants on selected program activities. Then the mother works directly with her child while staff members observe and give consultation. They assessed the infant participants on the Bayley Scale of Infant Development and the Denver Developmental Screening Test (DDST) upon entry and at later intervals. Significant progress results were obtained on the DDST when tested at two later six month intervals. The infants had made significant gains in their developmental progress in all areas. In one comprehensive program for Down's syndrome children (Hayden and Dmitriev, 1975), the infant program reported

encouraging results. The program philosophy and emphasis encouraged entry into the intervention as soon as possible. Down's syndrome, which usually includes mild to moderate mental retardation, can be detected at birth. Therefore, these infants can be started in a learning program very early. These infants were from 5 weeks to 18 months old. They were taught sensory motor skills such as: rolling over, sitting, crawling, standing, walking, attending, saying words, etc. The mothers were used as primary trainers and were involved in weekly classes for 30 minutes of individualized instruction. When assessed on the Gesell Preliminary Behaviors Inventory at three to eighteen months, they showed a mean difference of one month between their chronological age (CA) and their mental age (MA). This was compared to a population of Down's syndrome children without intervention who showed a developmental lag of one year when assessed at nineteen months.

Another program (Brassell, 1977) involved 73 infants with varying degrees of handicaps. These infants were assessed on the Bayley Scale of Infant Development upon entry and subsequently at four to five month intervals. The parents were rated during weekly home visits on the Caldwell Inventory of Home Stimulation. The mothers were trained to stimulate their infant according to an individualized program tailored to meet the needs of their child. The intervention could focus on skills in the major headings of: cognitive, language, motor, self-help, behavioral, or preschool programming. The results indicate that the degree of intellectual handicap had an effect on the infant's progress in the intervention program, with the more handicapped children making less progress. Also, about 90 percent of the

infants who made substantial developmental gains had mothers who were rated high on the scales of mother-infant interaction.

Therefore, Bronfenbrenner's recommendation (Bronfenbrenner, 1975) of very early intervention with involvement of the mother as the primary trainer has proven to be efficacious. This paper will concentrate on one programmatic approach to this model.

## Chapter 2

### THE PROGRAM AND ITS PARTICIPANTS

This particular approach involved infant stimulation and pre-school programs operated by the Pennsylvanian Mental Health-Mental Retardation Center. These programs are operated in a five county area. They involve infants from birth through approximately two years old in the infant stimulation programs. When children reach approximately two years of age, they are involved in the preschool progress centers and continue until entry into public school. Infants and children are accepted at any time from birth through approximately four years of age. Since involvement can begin at any time, some children have long term exposure; however, some enter late and may be involved only on a short term basis. Many participants who are involved on a long term basis are severely involved physically or intellectually. Therefore, in the infant programs participants include those who are brain damaged, blind, deaf, physically handicapped, or mentally retarded. Also, those infants are included who due to birth trauma, abuse, neglect, long hospitalizations, prematurity or other factors are classified as "at risk" for developmental delays.

The infant stimulation program trains the parents, or primary caregivers, to stimulate the child at home. Initially the child is assessed on the Learning Accomplishment Profile (LAP) and then is begun on a program of instruction based on their developmental needs. The LAP was developed at the Chapel Hill Outreach Project and is a composite of items from standardized infant scales of development, including the Bayley, Cattell, Denver and others. The items are

grouped into the six developmental areas of Language, Cognitive, Self Help, Gross Motor, Fine Motor, and Social/Emotional. After assessment, the LAP is used as a continuous assessment and program planning tool. Infants are seen individually with their parents initially on a weekly basis, with longer intervals between sessions as parents and their children begin to make progress. With the young or severely delayed infant such tasks as tracking, head holding, cooing and rolling over may be the focus. Later skills to stimulate may involve sitting, crawling, saying words and walking. The LAP includes tasks from birth to 72 months.

Staff members include a primary therapist/teacher who conducts the individual sessions, a case manager who provides follow along support with referral to additional services, and a speech therapist for children with specific language problems. Each child is re-assessed on each visit as to their readiness to progress to another developmental task. Earlier skills promote learning of later skills and are taught in developmental sequence at the individual pace of the infant. Infants and children are involved as long as services are needed, or until they can be transferred to another learning situation.

The preschool progress center involves the children in a group classroom experience. Children are grouped according to age and developmental levels in classes of from five to fifteen. Two teachers conduct individual and small group learning experiences for three hours each morning. The children are instructed in basic developmental tasks. A speech therapist sees children on a regular basis and speech and language goals are incorporated into the total

plan of instruction. Learning tasks may include toilet training, dressing, speaking in sentences, interacting appropriately with peers or attending to task for a specific amount of time. Progress is assessed continuously in the LAP with a full psychological assessment using the Stanford-Binet administered near two years of age and again when referred to public school at approximately five years of age. Parental conferences are held when needed. Consultation is available to staff when needed from a psychiatrist, psychologists, and social workers.

THE METHOD

This study was conducted with the purpose of assessing gains made by the participants in the areas of language and cognition. The gains are measured on the LAP. The participants are grouped into early entry (EE) and late entry (LE). Early entry is defined as beginning in the stimulation program before age twelve (12) months. Late entry is defined as entry into a program after eighteen (18) months. Twenty-four children were involved in this study. The children's scores on the LAP in the areas of language and cognition were assessed upon entry and compared to six month scores. The developmental gain was noted in months.

The main purpose of this study is to show that early stimulation is effective with "at risk" children. Therefore, a subgroup of matched pairs of children was formed from the main group. Since children who have had no previous intervention can enter a program at any time, a group of these children were compared with children already enrolled. Therefore, these late entry control children were paired with the same sex, age and similar diagnosis early entry children. Each child was assessed on the LAP at the age of entry of the control child into a program. The LAP is used both as an assessment and program planning instrument. Therefore, the late entry control child was assessed on the LAP when entered into a program. The already enrolled child to be compared against was assessed continuously on the LAP while enrolled. These scores were compared in the areas of language and cognition.

Of the four matched pairs, when assessed one pair was equal and was functioning at age level. Each of these children was diagnosed mildly handicapped (i.e. developmental language disorder; heart failure at birth). Also, the early entry experimental child had only been involved in a structured program for seven (7) months prior to the assessment. Of the other three pairs, the early entry experimental (EEE) children had been in a structured stimulation program for eleven (11), twenty (20), and twenty-six (26) months, respectively. These three matched pairs also involved children who were diagnosed severely impaired (mental retardation, Down's syndrome, etc. ). The differences in their functioning levels were great (see table 1). The differences in functioning levels between these other three pairs ranged from eight (8) to twenty-eight (28) months.

The two hypotheses tested in this study are as follows:

#### Hypothesis 1

Children enrolled in an intervention program before age 12 months will make more progress for their first six months than children enrolled after 18 months.

#### Hypothesis 2

Children exposed to intervention early will be functioning better than children who enroll later. This subgroup will be assessed and compared at the entry of the later child into a program.

## Chapter 4

### RESULTS

In the main group of 24 children Hypothesis 1 was statistically analyzed with a  $t$  test. Significant results were obtained, however, in the opposite direction than predicted ( $\underline{t} = -2.5$ ;  $\underline{p} < \text{than } .018$  Language;  $\underline{t} = -2.5$ ;  $\underline{p} < .018$  Cognition). The late entry (LE) children did significantly better than the early entry (EE) children in both language and cognition for their first six months in a program (see table 2).

In the subgroup of matched pairs the  $t$  test for related samples was used to statistically analyze Hypothesis 2. Significant results were obtained in favor of the early entry experimental group (EEE) for cognition ( $\underline{t} = -2.96$ ;  $\underline{df} = 3$ ;  $\underline{p} < .03$ , for a one-tailed test). Results approached significance for the area of language ( $\underline{t} = 1.9$ ;  $\underline{df} = 3$ ;  $\underline{p} < .08$ , for a one-tailed test). Therefore, early entry experimental children did significantly better in cognition than late entry control children when matched for age, sex, and diagnosis (EEE  $\bar{X} = 20.5$ ;  $\underline{S.D.} = 8.66$ ; LEC  $\bar{X} = 8.75$ ;  $\underline{S.D.} = 6.39$  for language; and EEE  $\bar{X} = 24.25$ ;  $\underline{S.D.} = 6.5$ ; LEC  $\bar{X} = 11.25$ ;  $\underline{S.D.} = 5.85$  for cognition).

## DISCUSSION

The results obtained from the main group would indicate that older children make more gains in the first six months of structured stimulation than younger children. This may be attributed to many factors. One of these factors is that the early entry children may be more severely handicapped. The conditions which cause early referral would probably be long term and severely handicapping. As noted in an infant stimulation study cited earlier, more severely handicapped children make less progress (Brassell, 1977). When looking at the 24 cases contained in the main group, more of the severe diagnoses are contained in the early entry group.

Another factor to consider is the age of the children in each group. The ages of the early entry children range from 1 month to 11 months. The ages of the late entry children range from 20 months to 48 months. The tasks to be learned in a six months time frame for a 2 month old would be considerably different than for a 20 month old. The 2 month old may be concentrating on tracking objects with his eyes, and holding his head up and cooing. The 20 month old may be concentrating on such tasks as walking, running, talking in words, and speaking in sentences. Much less measurable progress in six months could be made by a younger infant than an older child based on the tasks involved and the ages involved.

Another factor could be that the instrument used to measure progress, the LAP, is structured differently at the earlier ages than at the later ages. For instance, at intervals to six months

the LAP has tasks at almost monthly intervals. However, when measuring at higher ages there may be intervals of many months between individual tasks, therefore allowing more credit for less tasks. Also at the higher levels the tasks may have broad age ranges for attainment (i.e. 36 through 48 months). Therefore, different assessment ages makes precise measurement of six months' progress difficult.

Another factor which was not controlled for in this study was mother's level of responsiveness to her infant. In one study mothers and their infants with Down's syndrome (severe handicap) were studied and their interactions were compared to those of normal infants and their mothers (Jones, 1980). It was found that Down's syndrome infants did not take the initiative to interact with their mothers as much as normal infants. Also more of the interaction with Down's syndrome infants was mother-directed. The Down's syndrome infants' timing of responses appeared to be different. These handicapped infants appeared to lack the sensitivity to the potential for a response from their mothers. There seemed to be less intention and expectancy of a response. Therefore, these severely handicapped children experienced less opportunity for enriched feedback and stimulation from their mothers, since responsiveness of an infant naturally creates a cycle of responsiveness of the mother (Jones, 1980). Thus, these severely handicapped infants may have more difficulty developing the expectancy motivation mentioned earlier and may have less of an effect on or control over their environment.

In the subgroup of matched pairs the differences were in treatment. The early entry experimental group showed significantly better cognitive

functioning levels when compared to the late entry control group. In examining these four matched pairs individually, the pair with no difference was each functioning at age level. Their diagnoses were language disorder and heart failure at birth, which would indicate mild involvement when they were assessed at 18 months. The other three pairs were diagnosed with severe handicaps of mental retardation, Down's syndrome, etc. Between these pairs there were dramatic differences in the levels of functioning (see table 1).

The conclusions to be reached would include that when infants are severely handicapped, early stimulation causes significantly higher functioning levels, particularly in cognitive tasks. This higher level of functioning is noted in programs where the mother is utilized as the primary teacher/trainer of her infant (Beller, 1979; Bronwich, 1977; Hayden and Dmitriev, 1975; Honig, 1977; Jones, 1977; Katz, 1971; Landerholm, 1982; Neilson et al., 1975; Ramey and Smith, 1976; Ramey et al., 1977; Ruddy, 1982; Schaefer, 1980).

Various reasons can be posited for the significant difference which early intervention makes. Some of these reasons may rest with the improvement of the early interactions of the mothers with their infants (Belsky et al., 1980). This change in the quantity and quality of interactions perpetuates the cycle of improved reactions in the infant. Based on the earlier cited motivational model the infants begin to realize that they can create an effect in their environment which increases their efforts to control their environment (Yarrow et al., 1972; White, 1961). This change in the responsiveness and observed capacity of the child increases the responsiveness of the mother which perpetuates this reciprocal cycle. This improvement in

the child also instills an element of hope in the mother that she can help her handicapped child develop more fully.

All of these factors may work together to compliment each other and create an effect. Whatever factors are at work, early intervention programs appear to be effective means for increasing the functioning level of severely handicapped infants. Bronfenbrenner's (1975) recommendation of early, long term intervention is particularly important for these severely involved infants.

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## APPENDICES

TABLE 1  
Matched Pairs

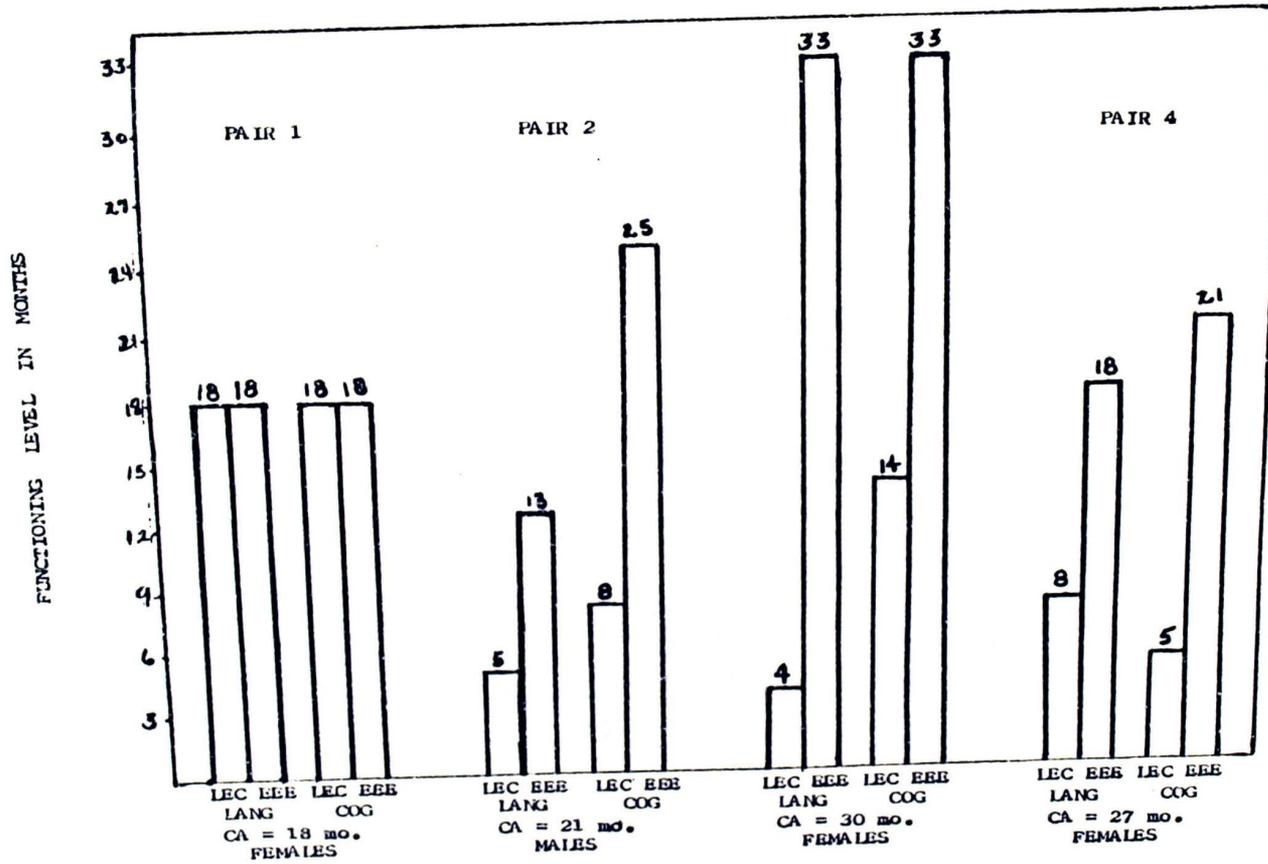


TABLE 2

|                 | <u>Main Group</u>          |             |              |
|-----------------|----------------------------|-------------|--------------|
| <u>Language</u> | $\bar{X}$                  | <u>S.D.</u> | <u>Range</u> |
| Early Entry     | 4.35                       | 3.28        | 0-11 mo.     |
| Late Entry      | 9.2                        | 5.67        | 2-18 mo.     |
|                 | $t = -2.52 \quad p < .018$ |             |              |

|                  | <u>Main Group</u>          |             |              |
|------------------|----------------------------|-------------|--------------|
| <u>Cognition</u> | $\bar{X}$                  | <u>S.D.</u> | <u>Range</u> |
| Early Entry      | 4.57                       | 2.49        | 1-8 mo.      |
| Late Entry       | 9.3                        | 6.0         | 2-18 mo.     |
|                  | $t = -2.53 \quad p < .018$ |             |              |

$\bar{X}$  = mean

S.D. = standard deviation

TABLE 3

| <u>Language</u>         | <u><math>\bar{X}</math></u> | <u>S.D.</u> |
|-------------------------|-----------------------------|-------------|
| Early Entry Exp.<br>EEE | 20.5                        | 8.66        |
| Late Entry Cont.<br>LEC | 8.75                        | 6.39        |

$\underline{t} = 1.91 \quad \underline{df} = 3 \quad \underline{p} < .08, \text{ one tailed}$

| <u>Cognition</u>        | <u><math>\bar{X}</math></u> | <u>S.D.</u> |
|-------------------------|-----------------------------|-------------|
| Early Entry Exp.<br>EEE | 24.25                       | 6.5         |
| Late Entry Cont.<br>LEC | 11.25                       | 5.8         |

$\underline{t} = 2.96 \quad \underline{df} = 3 \quad \underline{p} < .03, \text{ one tailed}$

$\bar{X}$  = mean

S.D. = standard deviation