

DEVELOPMENTAL OBSERVATIONS OF KINDERGARTEN
CHILDREN'S UNDERSTANDING IN REGARD TO
CONCEPTS ABOUT PRINT, LANGUAGE DEVELOPMENT,
AND READING BEHAVIOR

A DISSERTATION
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF EDUCATION
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

COLLEGE OF EDUCATION

BY

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DENTON, TEXAS

MAY 1978

The Graduate School
Texas Woman's University
Denton, Texas

April 12 1978

We hereby recommend that the dissertation prepared under
our supervision by R. Kaaren Chandler Perkins
entitled Developmental Observations of Kindergarten
Children's Understanding in Regard to Concepts
About Print, Language Development, and Reading
Behavior

be accepted as fulfilling this part of the requirements for the Degree of
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ACKNOWLEDGEMENTS

The author of this dissertation would like to acknowledge the help, support, and guidance provided by her major professor, Dr. Rose Spicola. Her questioning, probing, and prodding made it possible for this project to be completed. Special thanks is also given to Dr. Margaret Griffin for the guidance and support in this endeavor.

The author is appreciative of the support provided by the other committee members: Dr. Patricia Fagan, Dr. Shirley Hollingsworth, and Dr. Betty Mason.

Special thanks is extended to Dr. Basil Hamilton for his assistance in the statistical analyses. Dr. J. B. Spalding also contributed in this capacity.

Deep appreciation is extended to Linda Berger and Marge Watson for their expert editing and proofreading abilities. However, the author accepts final responsibility for the completed product.

Finally, the author is grateful to Alexia, Holly, Shannon, Andrew, and Christopher, and all the other children who were always willing volunteers throughout the author's study.

DEDICATION

The author would like to dedicate this dissertation to her daughter, Alexia Leigh, who has allowed the author the honor and privilege of being a mother and sharing Alexia's childhood.

In addition, this work is dedicated to the author's parents, Katherine and Ruby Chandler, in recognition of the early childhood experiences they provided and of the continuing love and support they have provided.

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CHAPTER I

Introduction

Background of the Problem

That there is a definite relationship between oral language performance and reading ability has been firmly established (Chomsky, 1972a; Clay, 1972a; Lundsteen, 1977). Oral language and reading are two aspects of the broad concept of language ability.

Strickland (1962) found in her research that achievement in oral language is related to general achievement in school. Her results emphasize the importance of oral language for all academic areas. Loban (1963) conducted a 12-year longitudinal study and one of his main conclusions was that skills in reading, writing, speaking, and listening were all positively related. He found that generally children who scored low on measures of oral language also tended to score low on measures of reading achievement and that the reverse was also true; children who scored high on measures of oral language tended to score high on measures of reading achievement.

A long time researcher in the field of reading stated that early language development is the foundation of reading (N. B. Smith, 1975). She went on to state that, with the

exception that reading utilizes printed words and language utilizes spoken words,

early language development and beginning reading have all elements in common . . . both serve the same purpose--that of communication, both use the same language symbols with the same meanings, both use the same kinds of sentences in which words are arranged in the same order or orders. (p. 400)

Clay (1972a) supports this idea in her book when she says

The child who already uses a wide range of English language features in a flexible manner will find it easier to remember the sentence structures in his book. He simply has to select the appropriate structures from his speech repertoire. The child with rich experiences of books will have greater understanding of bookish forms of language and more motivation to master the art of reading. (p. 31)

Most of the present-day psycho-linguists such as Goodman (1972) and F. Smith (1971) believe that children have had experience with all the cognition skills involved in learning to read by the time they begin school. Goodman (1972) states reading "instruction will be successful to the extent that it capitalizes on children's language learning ability and their existing language competence" (p. 508).

The more language experiences a child has, the more knowledge and meaning he has to bring to the printed page. Those children high in reading ability come from "a much richer verbal family environment" (Milner, 1951, p. 107) and engage in conversations with their parents more often than low achievers. To further substantiate the importance of the relationship between oral language and reading, Hildreth (1964) reports that children are able to read words in their vocabulary more easily than words not in their vocabulary and the quality of the child's language is highly related to his reading success. She also found that speech defects and reading difficulties are related and, most importantly, that children who are deficient in reading are also deficient in their oral language.

The importance of early language experience upon subsequent success in reading was discussed almost 30 years ago by Almy (1949). Durkin (1974-75) also supports

the importance of early language experiences in her study of early readers. She found that these early readers were often read to by their parents, engaged in frequent conversations with their parents, and had their questions answered. These parents also modeled reading as an enjoyable, pleasant activity.

Larrick (1975) made the observation that

Children who learn to read quickly and easily are usually the ones who speak fluently, ask questions readily, and are at ease with oral language generally. They have literally talked their way into reading. (p. 15)

Statement of the Problem

Given the importance of oral language upon subsequent success in reading, how could this relationship be analyzed? More importantly, how could the relationship be analyzed before children are formally introduced to reading? Therefore, the problem was that of looking at the relationship between oral language development and success in reading before a child was expected to be reading. The problem became one of looking at the growth of oral language and the growth of early reading behaviors or concepts about print.

When new teachers, parents, or college students were asked how they would go about teaching a child to read, the response was often that one should teach the names of the letters of the alphabet. Research has shown that most children who can read do know the names of the letters of the alphabet but that this ability has nothing to do with learning to read (F. Smith, 1971, p. 227). Then, how could a teacher of young children analyze prereading skills and language skills?

Clay, Gill, Glynn, McNaughton, and Salmon (1976b) have devised methods of looking at a child's performance in both of these areas. "Sentence repetition procedures are used to give insight into ways young children master the different structures found in English sentences" (1976b, p. 8). The Record of Oral Language (ROL) (Clay, et al. 1976b) was developed to provide teachers with a means to find out how well children can use their language. With sentence repetition this information could be gathered in a short period of time and progress could be detected over repeated observations.

The Concepts About Print (Clay, 1972b) (Sand test) provides the teacher with information about the child's readiness to begin reading. The Sand test, developed as the result of longitudinal observations of children, was used to check concepts about directionality,

that print and not pictures carries the message, functions of punctuation marks, letter and word identity. This could be used to check a child's progress in reading readiness the first year or two in school.

Using the ROL and the Sand test, this investigation examined the stability of the relationship of a child's oral language performance (or growth) and his prereading behaviors or concepts about print during the kindergarten year. The changes that took place on each measure during progress through a developmental kindergarten were examined. The influence of chronological age on each measure was also examined. The difference between boys' and girls' performances was investigated since boys are frequently six to eighteen months behind girls developmentally (Haber, 1977).

The specific questions that guided the experimental investigation during the course of this study were as follows:

1. Do children's performances on the ROL change as they proceed through a traditional kindergarten program? If so, what kinds of changes take place?

2. Do children's performances on the Sand change as they proceed through a traditional kindergarten program? If so, what kinds of changes take place?

3. What influences do sex and chronological age have on the performances on the ROL and the Sand test?

4. Are the scores on the ROL and Sand related?

The specific question that guided the descriptive investigation was what differences in concepts about print are there between readers and non-readers? The subjects were asked questions about what is reading, do you want to learn to read, why or why not, and can you read (Jansky & de Hirsch, 1972, p. 169).

Null Hypotheses

The null hypotheses were tested for significance at the .05 level.

1. There will be no significant difference in performance on the ROL at each observation.

2. There will be no significant difference in performance on the Sand at each observation.

3. Sex will not have a significant effect on the performance on either instrument.

4. Chronological age will not have a significant effect on the performance on either instrument.

5. There will be no significant relationship of the scores between the ROL and the Sand.

Significance of the Problem

Often the importance of early reading behaviors has been overlooked. It has been assumed that children learned these at home before they entered school. Tools are needed to assess these stages; the old term "readiness" does not

specifically tell a teacher what a child can and cannot do. Clay (1976a) states that "the average child will take about six months to learn the early reading behaviors necessary for the move to book reading" (p. 335). Therefore, periodic checks on a child's progress become important. The Sand test might be an instrument which could provide a teacher with an easy, short way of assessing a child's early reading behaviors.

When reading instruction formally begins, the teacher usually begins with assumptions about the child's knowledge of the reading process. In reality, the child may be confused about some very basic facts: he may not know that print rather than pictures carries the message, a word from a letter or even a sentence, the beginning of a sentence or line, that we read from left-to-right and top-to-bottom, that numerals are not letters. This list goes one and on. The spoken language that a child hears is not broken down into individual words with white spaces before and after. Oral language is continuous: "howdoyado", "pleasedtomeetya" (Lundsteen, 1977).

Downing and Oliver (1973-74) demonstrated with their studies that young children often "do not have the same concept of a spoken word as their teacher would possess" (p. 581). Young children (eight years and younger) often equate individual sounds and syllables with words. They may even confuse nonhuman sounds with words.

It has been said that a child needs to attain a mental age of six-and-a-half before he would be able to profit from reading instruction (Robinson, 1955). Elkind (1975) supports this view and the importance of language as it relates to reading in his list of

four requirements for successful beginning reading:

1. a language rich environment;
2. attachment to adults who model and reward reading behavior;
3. attainment of concrete operations;
4. an instructional program. (p. 36)

But what about the language and behaviors that come before a child is six-and-a-half or before he becomes concrete operational in thought? There have been cases where children learn to read early on their own (Torrey, 1970). Lundsteen (1977) says that a child may have difficulty in

reading because we are demanding a conceptual level that the child simply has not yet attained. . . . Reading seems so simple to most adults--so difficult for most children. (p. 194)

Fitts and Posner (1967) describe three stages in the development of learning skills: 1) the cognitive phase in which the child learns basic concepts and to which stimuli to pay attention; 2) responding appropriately to the stimuli; 3) the practicing of the skill until it becomes automatic. They theorize that most beginning reading instruction is probably centered at Stage 2 and that Stage 1 is probably overlooked by most classroom practitioners.

The two measures used in this study (ROL and Sand test) are attempts to provide teachers of young children with a means to assess children's oral language and early reading behaviors at an early point in time, before they are engaged in formal reading instruction. The results of this study could be significant or could have predictive value in identifying those children still at Fitts and Posner's Stage 1--that cognitive stage in which they learn basic concepts about the task.

Procedure

Subjects

This study was conducted in a North Texas suburban public school district. Parental consent forms were sent to the parents/guardians of 75 kindergarten children who were between the ages of 5-0 and 6-0 upon entry into school. These 75 children were randomly selected, using

a table of random numbers, from four elementary schools with a kindergarten enrollment of 265 students. The parents/guardians of 56 children agreed to participate in the study. The interviewer spent some time in the classroom prior to administering the two measures to the children so they would be familiar with the interviewer and thus lessen any anxieties they might have.

The kindergarten program of these four schools was the "traditional" or developmental kind. This statement was based on informal talks with the teachers, observations of materials, and an interview with the assistant superintendent in charge of curriculum and instruction. The kindergarten did not participate in any structured or "packaged" programs. The emphasis was on providing experiences for emotional, social, and physical development; fostering intellectual curiosity; language development; feelings of self-esteem through successful group interactions; and readiness for first grade. Most formal instruction including reading instruction was not begun until the children were in the first grade.

Data Collection and Procedures

Each of the 56 students was given the ROL and Concepts About Print (Sand test) instruments. The order of administration of the two instruments was alternated. The administration time was approximately 20 minutes for

each child. The sessions were tape recorded for verification of results.

This procedure was repeated three times during the school year--November, January, and March. The children met individually with the examiner in a quiet area of the school. Precautions were taken so that at no time were the children taken from absorbing activities in the classroom nor was the time spent with the examiner a stressful, testing situation.

Instruments

ROL

The ROL was developed so that teachers would be able to "observe aspects of a child's control over oral language and assess a child's ability to handle selected grammatical structures" (Clay et al., 1976b, p. 3). The ROL is comprised of two sections: 1) the Levels Sentences in which 42 sentences are grouped into three levels of difficulty with each Level containing two examples of seven different sentence types. Each of the 56 children was given the Levels Sentences. 2) The Diagnostic Sentences provide a more thorough assessment of a child's language performance but were not used in this study.

The children were asked to repeat the sentences after listening to the examiner say them.

By having a child repeat sentences
which represent a range of different

syntactic structures in English a teacher can learn as much in a relatively short time about his control of those structures as would be learned from listening to the child's spontaneous speech over a much longer time. (Clay et al., 1976b, p. 9)

The ROL can be used for many purposes. Clay et al. (1976b) feel that the ROL can be used to objectively analyze a child's ability to repeat particular grammatical structures; to compare a child's performances with himself over time; to group the children for teaching purposes; to help the teacher in her usage of particular grammatical structures with specific children in her class; and to aid in the planning of an instructional program for each child so that he can continue to grow in his command of his language. (See Appendix A.)

Sand

With the Sand test the child is asked to help the examiner read a book. This procedure takes about 10 minutes and checks "on significant concepts about printed language" (Clay, 1972b, p. 10). Twenty-four items are given (see Appendix B). Clay feels that the "test's greatest value is diagnostic. Items should uncover

concepts yet to be learned or confusions to be untangled" (p. 12). This procedure was also tape recorded.

Analysis of Data

Experimental Data

The data were analyzed using an A x B x C repeated measures design with repetition over factor A (Dayton, 1970). The level of significance used was .05. Factor A was the time the observations were taken; factor B was sex; factor C was age of subjects. The subjects, ranging in age from 5-3 to 6-3 at the initial observation, were grouped into three age levels. The repeated measures design was utilized for both the ROL and the Sand. The data were analyzed to test for the significance of the main effects of factors A, B, and C.

The children's scores on both measures were correlated following each of the interview sessions. Scatter diagrams were also plotted (Minium, 1970).

If the null hypotheses were rejected at the .05 level, then the alternate hypotheses were accepted. Further analyses were then performed.

Descriptive Data

Individual items on the Sand test of those few children who were readers were compared to those who were not readers. Their response to the interview questions was also of

interest to the investigator. The children were asked questions concerning their concepts about the reading process, whether they wanted to learn to read, whether they could read now and, if so, how did they learn to read. The responses the children made, if different from the expected response, were also of interest.

Limitations of the Study

This investigation was conducted and results were analyzed within the confines of the following limitations:

1. The time period for data collection was five months during the kindergarten year. More insights into the relationship of oral language performance and early reading behaviors could be obtained over a longer period of time.
2. The size of the sample was 56.
3. One school district in a suburban community of 40,000 to 60,000 inhabitants participated in the study.

Assumptions of the Study

This investigation was based on the following assumptions:

1. A representative sample of children's performances on the two instruments was obtained through random sampling.
2. The ROL is an indicator of a child's control over English language structures.

3. The Sand test is an indicator of early reading behaviors.

4. The testing was done under optimum conditions and the children were cooperative and eager to participate.

Definition of Terms

The following definitions were used for this investigation:

Oral language: the spoken communications or oral performance of a child as measured by the ROL.

Concepts about print--those behaviors or responses exhibited by a child that indicate he is attending to print as measured by the Sand test.

Readers: those children who were identified by the classroom teacher as reading and/or those children who could read unfamiliar, continuous text with 85% accuracy (Silvaroli, 1973).

Traditional kindergarten program: a program where the major emphasis is placed on developmental and readiness activities as opposed to more formal academic programs.

CHAPTER II

Review of Literature

There has been an abundance of information written about children's language development and their subsequent reading ability. The first part of this chapter is a review of some of the pertinent studies and writing that focus upon the relationship between oral language development and reading ability. Less has been written about early reading behaviors or concepts about print. It would appear, however, that this is a growing area of concern. The second part of this chapter attempts to review the information that has been written to explain how children begin the reading process. What concepts about print do beginning readers possess? What early concepts are important to the beginning reading process?

Oral Language and Reading Ability

The importance of oral language competency as it relates to reading ability has been expressed by many authorities (Almy, 1949; Larrick, 1975; N.B Smith, 1975; & Strickland, 1962). Strickland (1962) states that

the school assumes that each child
has developed some command of
language and builds its program

of listening, speaking, reading,
and writing on this foundation.

(p. 1)

This assumption can present problems when the child's language background and experiences do not match those of the books he is expected to master. Strickland's study of 575 children spanned three years and grades one through six. She found that there was indeed "a relationship between silent reading comprehension and the structure of children's oral language" (p. 86). Those children who ranked high in reading comprehension tended to use longer utterances than those students who ranked low--especially at the higher grades. How soon can these differences between high ranking children and low ranking children be detected?

Early language development is vital to reading believed N. B. Smith (1975). She felt that children are language users when they begin school and bring with them a great deal of knowledge and experience in regard to vocabulary, sentence types and sentence patterns, and gain meaning from connected discourse. These abilities are developed before the child begins school. The child also becomes aware, via modeling and imitation of his parents, of how to hold a book, that the print carries the message, the importance of picture cues, recall, enjoyment of reading,

and "Most important, he had the language facility necessary to understand and appreciate the story which his mother had read to him" (p. 401). This language facility is vital when the child begins to "read" his own stories and to experience reading in school.

Loban (1963) followed 338 children for a period of seven years in regard to language usage. The data from subgroups of children were also scrutinized. The two subgroups were those children who ranked extremely high and low in their language proficiency. He found that

Those who are high in general language ability are also high in reading ability. Those who are low in general language ability are also low in reading ability. In addition, the gap between the high and the low groups is apparently widening from year to year. (p. 85)

The high group had a larger vocabulary, spoke more often and expressed themselves more easily, used more uncommon words, was more fluent, and used more complex language structures. He found a positive relationship among all aspects of the language arts: reading, writing, listening, and speaking. He states, "Those who rate in the highest group in oral

proficiency are also those who are completely above the median in reading for the random and low groups" (p. 8).

Loban also had an interesting observation concerning sex differences. He states

The frequently recurring pattern of boys at the extreme ends of a number of measures is interesting. Whatever the causes, cultural or genetic, boys in this study do very poorly in reading when they are low in language ability and excel when they are high in language ability. (p. 89)

Gunderson (1976) supports the fact that "there are sex differences in reading and language" (p. 306). However, she feels that the causes and implications of these differences are not yet known. The determinants may be biological, genetic, or cultural.

Ruddell (1965) found children achieved greater comprehension when the reading material was more similar to their oral language than when it was not. One could imply from this that children with a greater degree of oral language competence would be able to cope with a broader range of reading materials.

In her work with young children who read early, Durkin (1966) reports that these children tended to come from homes where there was a great deal of verbal interaction between parent and child. Important factors are

the presence of parents who spend time with their children; who read to them; who answer their questions and their requests for help; and who demonstrate in their own lives that reading is a rich source of relaxation, information, and contentment.

(p. 136)

The importance of the child's early environment on language acquisition and later competence and then reading is emphasized by Larrick (1975). She feels that "facility with oral language" (p. 193) is one of the important factors that relates to reading readiness. A way to develop reading readiness is "to develop each child's aptitude for reading through rich experiences with oral language" (p. 15).

McDonell (1975) basically agrees with Larrick when she "maintains that the child must become accustomed to written forms of language by listening to it" (p. 443). She feels that one reason why children have failed to learn to read or had reading difficulties might have been the separation of language and reading.

Robinson (1955) states that "the skill with which a child uses the language in which he reads is basic to reading success" (p. 264). The level of language development is extremely important to children's achievements in reading.

A study of 36 children who ranged in age from six to ten emphasized the correlation between reading exposure and oral language (Chomsky, 1972a). The children were tested on five syntactic structures, these were found to develop in an invariant sequence although the age of acquisition varied. Information about the children's varied reading exposures was gathered using questionnaires for both parent and child, daily logs of reading done, and books listened to. She states, "The child who reads (or listens to) a variety of rich and complex materials benefits from a range of linguistic inputs that is unavailable to the non-literary child" (p. 23). Other factors which indicate reading relates to linguistic stages include the Huck inventory, number of books with which the child was familiar, complexity of the books, and I.Q. "Prereaders in higher linguistic stages are read to by more people and hear more books per week, at higher complexity levels, than children at lower linguistic stages" (p. 27). There is no doubt of the positive relationship between language development and reading.

The importance of the adult/child language interaction pattern was also explored by Milner (1951) in her study of 42 first grade children who scored high and low on reading measures. Her conclusions included the following:

The high-scoring children are surrounded by a much richer verbal family environment than are the low-scoring children:

- a. they have more books available to them,
- b. they are read to by personally important adults more than are the low-scoring children. (p. 107)

In developing their ability to gain meaning from print, Hildreth (1964) feels that children develop this ability by

experience primarily and mainly with the oral language. The more extensive the child's experiences in the language of speech, therefore, the better equipped he is likely to be in getting an author's meaning. (p. 172)

This view is further supported by McCormick (1977) who feels that children should be read aloud to. Hearing the language of books facilitates their dealing with the language patterns to which they will be exposed when they begin to read themselves. In her study of how gifted children learned to read, Price (1976) reported that 34 of the 37 children were read to by the parents from infancy through the time of the study.

Elkind (1975) also found support for the importance of early language and reading experiences between parent and child in two studies, involving 16 and 38 children, of early readers.

Our parent interview data suggest that a rich background of early experience with spoken and written language provided by homes where books and magazines are plentiful and where parents frequently read to the children is also important for successful reading. (p. 36)

Goodman (1972) and F. Smith (1972) both feel that most children approach the reading task as competent users of the language to which they have been exposed. Therefore, increasing a child's language experiences will increase the

linguistic abilities that the child brings with him to the reading task.

Lundsteen (1977) stressed the developmental relations between language-learning and reading" (p. 192). She feels that reading actually begins when a child is born, if we view reading as an extension of oral language. Oral language provides the background for reading. The richer and more complex the oral language, the more able a child is to relate and make sense out of the printed symbols on the page. She states

oral language and thought support reading proficiency, serving as background. If the child's oral language/thought differs from the printed message, the effect is inhibiting. (p. 194)

Given the importance of language as it relates to reading in general and to early reading behavior specifically, how does one assess a child's oral language abilities? There are numerous ways to accomplish this beginning with simple word counts, vocabulary size, mean sentence length, parts of speech, evaluation of sentence structure, etc. Another way is sentence repetition: the ability of the child to repeat sentences that he has heard (Clay, 1976b). The child is asked to repeat sentences containing a variety

of linguistic forms that are arranged in order of increasing difficulty. Theoretically, if a child has not internalized certain structures, he will not be able to repeat them. He will rephrase them according to his own language competence or skill. Clay (1971) states

There are theoretical problems
in attempting to relate skill
in repeating sentences to skill
in producing sentences, but there
is a body of opinion which holds
that what is produced correctly
in imitation reflects not only
the grammatical knowledge that
the child uses in producing his
sentences but also those structures
which are in the process of acquisition and which have not yet
entered spontaneous utterance.

(p. 1)

There are others (Fraser, Bellugi, & Brown, 1963; Menyuk, 1969) who feel that children's abilities to imitate sentences precedes their spontaneous sentence productions and comprehension. Therefore, they may feel that imitation is not the best way to determine a child's control over linguistic structures.

Clay (1971) used two samples of 160 children in her study of sentence repetition. The variables were child's age (5-0 to 7-3), sex, and parents' language group (professional, English, Maori, and Samoan). For all four language groups, the mean number of sentences repeated correctly was 19 of 40 (p. 23). The means increase with age and language groups with the professional group and the oldest children receiving the highest scores. The professional group had a mean of 26.5 while the Samoan group had a mean of 12.1. The mean for the 5-0 age group was 12.13 and for the 7-0 age group it was 19.13.

Other researchers also support the use of sentence repetition. Jansky and de Hirsch (1972) feel that

sentence memory is also related to what might be called "sentence sense", or the ability to anticipate an unfamiliar word by virtue of cues provided by the surrounding syntactic configuration. Sentence memory might be a good predictor of reading because the ability to make correct guesses from the available options is as essential for reading as for speech. (p. 47)

Hebb, Lambert, and Tucker (1973) also feel that imitation enables one to evaluate a child's language competence. "Imitation depends upon prior perceptual learning. The child can imitate only what already is within his competence" (p. 60).

Clay, et al. (1976b) developed the ROL as a means of assessing a child's syntactic abilities. A busy classroom teacher may not have time to write down the various syntactic structures a child uses and the ROL is one means of collecting this information in a relatively short period of time. This information can then be used to help the child advance his abilities or for the teacher to structure the program within the classroom on the child's level. Repetition of sentences at various syntactical levels

can give a more generous assessment of his ability to handle grammatical structure than is given by the language he himself produces. (p. 9)

By careful analysis of the miscues, much more than a numerical score can be learned of a child's language since

he usually repeats the difficult sentence in a way which indicates the structures over which he has

control. By using the ROL sentences and making a careful record of children's attempts at repetition, a teacher has an objective means of describing changes in children's oral language. (p. 9)

Concepts About Print

Given the relationship between oral language and reading ability, how does the young child begin the reading process? What are some of the early concepts that children have about reading? Which concepts are important in order to begin to read?

F. Smith (1971) states that some theorists feel that a child must learn the names of the letters of the alphabet before reading instruction is begun since there is a high correlation "between the ability of children to identify letters and their ability to learn words" (p. 227). Perhaps the reverse is true: the ability to learn words facilitates the learning of letters.

Gibson (1970) discusses the importance of distinctive features in letter identification. She states, "Differentiating letters, however fundamental, is still a very low-order aspect of reading skill" (p. 139). F. Smith (1971) feels that a reader will gain meaning from the

distinctive features of letters at times and, at other times, from whole words or more. Therefore, merely knowing the letters of the alphabet does not automatically insure success.

Almy (1949) found that "a significant, positive relationship exists between success in beginning reading and the child's responses to opportunities for reading prior to first grade" (p. 111). These early opportunities include a variety of activities: being read to; interaction with print on signs, advertisements, packages, and games; the naming of the letters; attention directed to whole words; help with printing of letters and words; and Sesame Street or television. With so much attention directed toward print, is it any wonder that children with positive prereading experiences learn the names of the letters of the alphabet?

Other investigators have studied the backgrounds of early reading children (Chomsky, 1972a; Durkin, 1966; Elkind, 1975; & McCormick, 1977). McCormick (1977) stresses the importance of exposing young children to reading.

Research evidence indicates that reading aloud to children significantly improves their vocabulary knowledge and their reading comprehension. (p. 139)

Durkin (1966) found in her two studies of children (121 in California and 133 in New York) who learned to read early that they tended to come from families which were very willing to give the children help, particularly in response to the child's questions. She feels strongly that learning to print and learning to read go hand in hand. She describes the sequence as

- a) scribbling and drawing, to
- b) copying objects and letters
of the alphabet, to
- c) questions about spelling, to
- d) ability to read. (p. 137)

Chomsky (1972b) feels that young children ought to be allowed "to be active participants in teaching themselves to read" (p. 119). If the child would be encouraged to write and then read what he had written, rather than the usual read first and then learn to write, this would demand that the child be in charge and take an active role in the reading process.

How do children make the transition between interest in print and reading or between nonreading and reading? Clay (1974) states, "One of the first code-breaking activities for the beginning reader to discover concerns arbitrary conventions of how books are presented" (p. 275). These arbitrary conventions include such things as front

vs. back of the book, where to begin (upper left), in which direction to proceed (left to right), and where to go next (return sweep to left).

Clay (1972b) has devised a way of making a quick check on a child's concepts about print. The test is called Concepts About Print and uses a child's book entitled Sand that the child is asked to help the interviewer read. "The test reflects changes in reading skill during the first year of instruction" (p. 10). The child is asked to indicate the front of the book, directionality rules, first and last, punctuation, word and letter reversals, that the print carries the message, capital and lower-case letter correspondence, one and two letters, and one and two words (see Appendix B). Clay feels that

the test's greatest value is
diagnostic. Items should
uncover concepts yet to be
learned or confusions to be
untangled. (p. 12)

The Sand test can be used to determine where a child is or what concepts he has about print and to check on his development of these concepts during his first year or two in school. This would avoid the problem of beginning instruction on Fitts and Posner's (1967) Stage 1 (the

cognitive phase) rather than beginning instruction at Stage 2 where the child responds appropriately to the stimuli.

In her study which involved 60 preschool children ranging in age from 5-0 to 6-7, Hollingsworth (1977) reports a reliability coefficient of 0.85 for the Sand using all 24 test items. She states, "Concepts About Print may be considered to be a reliable instrument for use with preschoolers" (p. 82). These children had had no formal reading instruction. Her results show

The cognitive attainment measure of Concepts About Print is by far the most advantageous predictor of every reading criterion, whether part scores or total. (p. 136)

Another recent researcher (McKenzie, 1974) found that the Sand did indeed indicate differences between nonreaders and readers with the readers scoring higher. Her study included 21 children who were placed into three groups of seven each: Group I consisted of precocious readers, Group II was nonreaders, and Group III was older readers. The older readers also tended to score higher than did the nonreaders. Although the children ranged in age from 5-9 to 7-2, their mental age ranged from 8-0 to 8-2. Group I had a mean score of 8.1 (out of a possible

24) on the Sand test; Group II had a mean of 5.7; and Group III had a mean of 8.2.

In a study of 42 children ranging in age from 4-0 to 8-0 years, Downing and Oliver (1973-74) substantiated the fact that children do experience linguistic confusion in regard to concepts about print. The children in their study did not have a clear concept of a word; they often confused it with isolated phonemes and syllables. In fact, they found "only one of the 14 oldest children (6-0 to 8-0 years) recognized that syllables were not 'words'" (p. 579). Therefore, teachers cannot assume that children beginning in reading instruction can distinguish between words and nonwords.

Ehri (1975) also found that prereaders experienced more difficulty in distinguishing certain word concepts than did older children. Included in her study were 35 children: 9 preschoolers (4-0 to 5-5), 16 kindergarteners (5-5 to 6-0), and 10 first graders (7-0 to 7-9). The children performed on five tasks: sentence generation, sentence segmentation, errors, sentence comparison and word selection. Her results showed that readers were superior to nonreaders in all aspects of the tasks tested.

Lundsteen (1977) discussed some of the confusions very young children may have about reading and reading

terminology. First of all, some children have the idea that the pictures carry the message rather than the print. They may confuse letters with numbers and vice versa. As Clay (1976a), Downing and Oliver (1973-74), and Ehri (1975) have indicated, young children may have confusions about what constitutes a word. These confusions range from nonhuman sounds, to phonemes, to syllables, to sentences. Lundsteen states that the confusions may persist for "at least nine months into the first year of reading instruction" (p. 197).

Clay (1976a) also feels that it takes the better part of an academic year for a child to develop these Concepts About Print. Therefore, the Sand can be used to make periodic checks of the child's progression in acquiring concepts about print.

This chapter reviewed some of the pertinent literature and studies that have been concerned with the relationship between oral language development and the acquisition of reading ability. The evidence overwhelmingly supports the importance of oral language development and its positive relationship to future academic success and, in particular, success in reading. How children begin to acquire their concepts about print is extremely important to teachers. Knowing what concepts or misconceptions a child has about the beginning reading

process will help the teacher to start where the child is and proceed from there. Information gained from the Sand can help the teacher sort out and/or identify the confusions a child may have during the initial reading acquisition stage.

Bloom (1976) discusses this point in his book and refers to it as "cognitive entry behaviors" (p. 30). He uses this term to refer to that learning which is needed for or is a prerequisite for a particular task. Bloom states, "Only if the student acquires the necessary entry behavior can he or she possibly attain the criterion of achievement specified for the learning tasks" (p. 33). He also feels that the critical tasks of a situation are most likely those tasks that come early or first in the process. How can it be determined which tasks come first in the reading process? Perhaps assessing a child's concepts about print will provide some insight.

The weight of this evidence suggests not only that there is a predictive relation between cognitive entry behaviors and subsequent achievement measures, but that cognitive entry behaviors are causal links in determining learning and in accounting for cognitive educational achievement. (p. 68)

CHAPTER III

Procedures and Design

This study was undertaken to observe the developmental progress of kindergarten children's understanding in regard to their oral language, concepts about print, and reading behaviors. How do children move from being unaware of print to being aware of print or from nonreading to reading? What changes take place in a kindergarten child's oral language development during the course of the school year? What differences are there, if any, in regard to concepts about print and oral language development between the kindergarten children who are reading and those who are not? Are the variables sex and chronological age important to these two broad areas: oral language and concepts about print? And to what degree are these two related? These are the questions that this study attempted to investigate.

Selection of the Instruments

ROL

During the pursuit of her studies, the investigator became interested in the work that Clay (1972a, 1972b, 1976b) was doing in New Zealand. The concern was how could one observe a child's progress in the areas of language and concepts about print and have some means

of comparing or keeping a record of this information so a child's progress could be observed over a period of time.

After investigating several methods of evaluating children's oral language, the Record of Oral Language (ROL) developed by Clay, et al. (1976b) was decided upon. It was decided to use only the Levels Sentences since the Diagnostic Sentences are for in-depth analysis of a child's language and that was not the purpose of this research. The Levels Sentences do provide a range of difficulty from simple to more complex sentence types. Clay, et al. (1976b) report a reliability coefficient of 0.93 for the Levels Sentences. The present 42 sentences used in the ROL were selected from 369 sentences during a pilot study. The main study utilized 123 sentences (of which 42 were the Levels Sentences) and 393 children in 131 public and private schools participated in the study. The children were all between 5-0 and 6-0 years of age on the date of testing. Clay, et al. (1976b) report a mean for the Levels Sentences of 22.3, with a standard deviation of 9.2 and a Kuder-Richardson 20 reliability coefficient of 0.93 (pp. 42-44).

The Levels Sentences consist of three groups of sentences of three difficulty levels (see Appendix A). Each of these levels contains 14 sentences of seven

different sentence types (Clay, et al., 1976b, pp. 12-14). The table below is a summary of the contents of the seven sentence types:

Table 1
ROL Sentence Types

Type	Construction			
A	Subject	+	Verb 'to be'	+ Simple Statement
B	Subject	+	Verb	+ Direct Object
C	Subject	+	Verb	+ Additional Construction
D	Subject	+	Verb	+ Indirect Object + Direct Object
E	Subject	+	Verb	+ Noun Clause
F	Adverb or Relative Pronoun	+	Verb	+ Subject
G	Subject	+	Verb Phrase	+ Object + Additional Construction

The child's responses are to be recorded verbatim. Checks can be used to indicate when the child has repeated the word correctly. All omissions, additions, substitutions, transpositions, and contractions should be noted. Sentences are counted correct only if they are repeated exactly as given.

The Levels Sentences of the ROL were used with a few children in a small pilot study to allow the investigator

to become familiar with the instrument. During these interviews it was determined that a few of the vocabulary items would be unfamiliar to American children (e.g., pushcart and pussy). The investigator corresponded with one of the authors (Glynn) regarding possible vocabulary changes. Glynn indicated that changes would be acceptable provided the substituted word be of the same linguistic class and contain the same number of morphemes, if possible (e.g., stroller for pushcart and kitty for pussy).

These changes were made (see Appendix C) and submitted to a panel of linguistic experts who determined that the changes did indeed meet the criteria. The sentences were then again used with the children to determine if the changes were suitable. It was then decided to use the sentences as modified.

Concepts About Print

The Sand test developed by Clay (1972b) was used to observe children's concepts about print. This instrument was also administered to a few children prior to the study to enable the investigator to become familiar with it.

The Concepts About Print test (Sand) is a children's picture book that the investigator reads to the child and asks the child questions about it during the reading. The story contains "errors" and it is noted if the child is

aware of them. The Concepts About Print test consists of 24 items which range from orientation of the book, directional rules, inversions, punctuation, word and letter concepts (see Appendix B). Therefore, a child can score between 0 and 24. Stanines are also given for the raw scores (Clay, 1972b, p. 11).

The research group for the Sand included 320 children between the ages of 5-0 and 7-0. A reliability test of 40 children of the same age yielded a correlation of 0.95. The validity with word reading for 100 children yielded a correlation of 0.79 (Clay, 1972b, p. 11).

The ROL and the Sand were administered to the children in the pilot study with the following results. It appeared that children who scored high on the ROL were also those children who scored high on the Sand and vice versa; those children who scored low on the ROL were those children who scored low on the Sand. In addition, girls tended to score higher on both measures than did boys. Therefore, it seemed that the instruments were discriminating the performances of boys and girls. The measures did appear to be positively related.

The Sample

A proposal for the study was prepared and submitted to a suburban, north central Texas school district. The

assistant superintendent in charge of curriculum and instruction accepted the proposal and then it was left to the principals of the individual elementary schools in the district whether or not they would participate. Four principals chose to participate out of the seven elementary schools in the district.

These four schools had fourteen kindergarten classrooms and seven teachers. The investigator visited with each of the teachers to briefly explain the study to them and to answer any questions they had. However, a detailed explanation of the behaviors to be observed in the children was not given so there would be no "teaching to the test". The teachers were assured that this investigation would require no special planning or participation of them nor would it disrupt their classroom routine. The teachers then provided the investigator with a list of the names of the children in each class. At this time children were removed from the list if they could not speak and/or understand English. Children who were six years of age before September 1, 1977, were also excluded as were any children who had a hearing, vision, or motor handicap that would keep them from being able to follow directions and/or participate in the study.

There were 265 kindergarten children enrolled in the participating schools and 16 of these children were excluded

for the reasons stated above. There were nine children who were six before September 1, 1977; six children could not understand and/or speak English; and one child was eliminated because of a motor handicap. The remaining 249 children were alphabetized and assigned a number from 001 to 249 according to the first letter of their last name. A table of random numbers was used to select 100 children.

Letters briefly explaining the study and consent forms were sent to the parents/guardians of the first 75 children selected (see Appendix D). The remaining 25 were to be used in case the response was poor. The response was excellent; 61 of the 75 or 81.3% of the parents/guardians agreed to participate in the study. There were nine who did not respond, three who did not wish to participate, and two whose child had been withdrawn from the school district during the selection process.

Of the 61 children participating in the study, 31 were males and 30 were females. There were 11 of these 61 children (five boys and six girls) who were either black, Hispanic or of another ethnic group. However, the numbers were too small to statistically analyze for this variable. Even though ethnic group was not available, 18% of the sample did belong to a minority. This figure

is very close to the 1975 figure of 16.8% for the school district. The assistant superintendent did not have current 1977 figures, but he felt that the ethnic make-up of the district had remained stable during the past two years.

At the time of the first interview (November, 1977) the children were assigned to one of three categories determined by age. The age of the children ranged from five years and three months to six years and three months. Table 2 indicates the distribution of both the sex and age variables.

It was felt that selection of the children to participate was handled in a manner consistent with sample selection. A good representation in regard to sex, age, and ethnic group was obtained. The children also represented a wide range of socio-economic backgrounds from low to high.

Ecological data on each child was obtained by J. Smith (1978). Each family was interviewed during the span of time that the children were participating in the study. A tremendous amount of data concerning each family's educational background, disciplinary procedures, television viewing habits, amount of reading done in the home, family routine, etc., was generated during these interviews.

Table 2
Distribution of Subjects
According to Age and Sex

Age	Males	Females
5-3	4	3
5-4	1	1
5-5	0	2
5-6	$\frac{3}{8}$	$\frac{2}{8}$
5-7	5	1
5-8	2	3
5-9	4	1
5-10	$\frac{2}{13}$	$\frac{1}{6}$
5-11	3	5
6-0	2	2
6-1	1	2
6-2	2	3
6-3	$\frac{0}{8}$	$\frac{1}{13}$
	Total n = 29 ^a	Total n = 27 ^a

^aOne girl was dropped from the study during the course of the first interview. She subsequently moved from the district before the study was completed. Four additional children moved from the district between the first and second interviews. The study was based on 56 children.

Interview Procedures

Prior to the first interview with the children, the investigator visited all the participating kindergarten

classrooms. During this time, the investigator spoke with each child involved in the study and mentioned that she would be back another day to talk again with them. It was hoped that this would ease any anxieties the children might have had about the interviewer. All interview times were checked with each teacher to see that the visits did not interfere with her schedule. At no time were the children made to leave or miss an activity that they did not wish to.

The interview sessions were held individually with each child in a fairly quiet place. All the sessions were tape recorded so the investigator could verify the results, especially in regard to the ROL. The Levels Sentences and the Sand test were given orally rather than being prerecorded. Even though some aspects such as volume, accent, and tone were not controlled since it was administered live, it was felt that the children would be more responsive to this method of presentation. Osser, Wang, and Zaid (1969) found that live presentations kept the interest of the children better than did recorded presentations.

The children were interviewed in November, 1977; January, 1978; and March, 1978. The investigator interviewed all the children at each of the three observation times. Even though this spread each data collection period

over more days, the benefit of not complicating the situation by adding another interviewer was gained. Since one person did all the interviewing and scoring, there was no need to check for reliability between interviewers. An added benefit was the consistency gained for each item of the two measures.

The order of administration for the ROL and the Sand was alternated with each child. This was done to guard again biasing the results due to fatigue or repetition.

The interview sessions usually lasted 15-20 minutes and were conducted in the following manner. Upon arrival at each school, the investigator went to the interview area and readied the materials and tape recorder. She then escorted each child to and from the interview sessions. Usually during the walk to the interview area, the investigator engaged the child in conversation about something of interest to the child (holidays, Christmas, snow, family, etc.).

Upon entry to the interview area, the investigator told the child that she needed some help and "I would like for you to help me." The child was shown the tape recorder and was told that he would be taped. The interviewer answered any questions the child had. Most children seemed to be familiar and at ease with the tape recorder.

In fact, they often helped to operate the tape recorder and frequently wanted to listen to themselves.

When administering the ROL, the following instructions were used (Clay et al., 1976b):

I would like you to say some sentences for me. Here is the first one. Say, Tom is running to school. Good. Now say, I want Bill to come. Good. Now say, What time is it? Now let's try these. (p. 18)

Level 2 of the ROL was given first. If the child scored between 12 and 14 on Level 2, credit for Level 1 was given and then Level 3 was administered. If the child scored between 3 and 11 on Level 2, Level 1 was then administered followed by Level 3. However, if a child scored between 0 and 2 on Level 2, Level 1 was given and the interview of the ROL was then terminated.

When the Sand was administered, the investigator gave the following instructions: "I'm going to read you this story but I want you to help me" (Clay, 1972b, p. 10). Then the Sand administered to the child beginning with Item 1 and proceeding through Item 24.

Following these two procedures, each child was asked a series of questions. The child's responses were rated

according to Jansky and de Hirsch (1972). The questions "What is reading? What do we mean by reading?" were asked and rated as follows:

Poor--I don't know. Child fails
to cope with the question.

Fair--Child associates descriptively,
e.g., reading a book, reading
a story.

Good--Child refers in some manner to
the correspondence between the
written and spoken word. (p. 169)

The following questions were also asked of each child:

Do you want to learn to read?

Why do (don't) you want to learn to read?

Can you read now?

If yes--how did you learn to read?

Then each child was asked if he would like to read a story to the investigator. He was given a variety of books from which to choose: preprimers and tradebooks. (See Appendix E for list of books available to children.) The child had the option of reading or not reading. If the children had been identified by the teacher as readers, or if they said they could read, or if the interviewer felt that perhaps they could read, they were asked to read the oral selection paragraphs in Silvaroli (1973).

An accuracy level of 85% on at least one paragraph or story was selected as the criteria to consider that particular child as being a reader. Before the interview was terminated, each child was told that the examiner would return and visit with him another time. Following this, the interview was terminated and the child was escorted back to his room.

Design

A repeated measures design was used to analyze the data generated by both the ROL and the Sand. The design was an A x B x C with repetition over Factor A. Factor A was the time of the interviews: one interview, A₁, was conducted in mid-November, 1977; interview A₂ was held in January, 1978; and interview A₃ was conducted in March, 1978. Factor B was sex: B₁ was the male group and B₂ the female group. The third factor, Factor C, was that of age. The subjects' ages ranged from 5-3 to 6-3 at the time of the first interview. They were grouped into three groups according to age: C₁ included ages 5-3 through 5-6; C₂ included ages 5-7 through 5-10; and C₃ included ages 5-11 through 6-3.

The data were analyzed at the .05 level of significance. The raw scores from both measures (ROL and Sand) were analyzed to test for the significance of the main

effects of Factors A, B, and C. A test of the interaction among Factors A, B, and C was also conducted. Stanine scores were also computed and reported for each child following each administration. Correlations were also computed after each interview to determine the degree of relationship between the two measures. Correlations were calculated for boys and girls and for the group as a whole.

The hypotheses that were tested were as follows:

1. There will be no significant difference in performance on the ROL at each observation.

2. There will be no significant difference in performance on the Sand at each observation.

3. Sex will not have a significant effect on the performance on either instrument.

4. Chronological age will not have a significant effect on the performance on either instrument.

5. There will be no significant relationship of the scores between the ROL and the Sand.

The alternate hypotheses were accepted if the null hypotheses were rejected and further statistical treatment of the data was carried out.

Descriptive information or data was gathered from the children's responses to the questions asked of them at the end of the interview. The individual responses to the items on the Sand were also recorded and analyzed. It was

interesting to note the kinds of responses given by those children who scored high on both measures and those children who did not. Also of interest were those responses given by the few children who were reading.

CHAPTER IV

Analyses and Results

Summary

The purpose of this study was to observe the developmental changes that occur in kindergarten children's oral language, concepts about print, and reading during the kindergarten year. The two instruments used to measure the children's progress were the Record of Oral Language (Clay et al., 1976b) and Concepts About Print (Clay, 1972b). This study interviewed 56 randomly selected kindergarten children. The children were interviewed three separate times (November, January, and March) during the kindergarten year. See Appendix F for the raw scores of the subjects on both measures.

The questions that guided this research were as follows:

1. Do children's performances on the ROL change as they proceed through a traditional kindergarten program? If so, what kinds of changes take place?

2. Do children's performances on the Sand change as they proceed through a traditional kindergarten program? If so, what kinds of changes take place?

3. What influences do sex and chronological age have on the performances on the ROL and the Sand test?

4. Are the scores on the ROL and Sand related?

This investigator interviewed the children to observe the differences, if any, in concepts about print between readers and nonreaders. All the children were asked a series of questions concerning a definition of reading: do you want to learn to read, why or why not, and can you read?

Experimental Data

A 3 x 2 x 3 repeated measures design and the Pearson Product Moment Correlation were used to test the following null hypotheses at the .05 level of significance:

1. There will be no significant difference in performance on the ROL at each of the three observation periods.

2. There will be no significant difference in performance on the Sand at each of the three observation periods.

3. Sex will not have a significant effect on the performance on either instrument.

4. Chronological age will not have a significant effect on the performance on either instrument.

5. There will be no significant relationship of the scores between the ROL and the Sand.

The statistical analyses and results are presented as follows:

1. Discussion of the ROL data, including sex and age as variables.
2. Discussion of the Sand data, including sex and age as variables.
3. Correlation of the ROL and the Sand.

The discussion of the experimental data will be followed by a discussion of the descriptive data and comments and observations concerning readers and nonreaders.

Factor A existed at three levels and refers to the time of the observations: the first observation, A_1 , took place in November; the second, A_2 , in January; and the third, A_3 , in March. Factor B was sex: B_1 was the male group and B_2 the female group. The third factor (C) existed at three levels. The children were put into three age groups according to their age at the time of the first observation. The first group, C_1 , included children age 5-3 through 5-6; C_2 included ages 5-7 through 5-10; and C_3 included ages 5-11 through 6-3.

ROL Data

The raw data were analyzed using the North Texas State University Statistical Library computer program ST024: three factor analysis of variance with repeated measures. Tables 3 and 4 present the means and standard deviations obtained for the various groups.

Table 3

Time, Sex, and Age Group
Means and Standard Deviations
For the ROL

		A ₁ (Nov.)	A ₂ (Jan.)	A ₃ (Mar.)	Total
B ₁ (Males)	C ₁ n=8	18.625 13.979 S.D.	20.000 13.858 S.D.	22.625 14.461 S.D.	20.417 13.580
	C ₂ n=13	22.231 9.471 S.D.	22.077 9.716 S.D.	25.308 8.892 S.D.	23.205 9.240
	C ₃ n=8	20.750 8.311 S.D.	23.125 8.758 S.D.	25.375 6.435 S.D.	23.083 7.790
	Total n=29	20.828 10.337 S.D.	21.793 10.445 S.D.	24.586 9.901 S.D.	22.402 10.237
B ₂ (Females)	C ₁ n=8	24.625 13.136 S.D.	25.500 14.000 S.D.	25.625 14.050 S.D.	25.250 13.132
	C ₂ n=6	20.500 10.840 S.D.	22.500 11.996 S.D.	24.167 11.268 S.D.	22.389 10.798
	C ₃ n=13	23.846 10.262 S.D.	26.154 10.407 S.D.	28.462 10.121 S.D.	26.154 10.171
	Total n=27	23.333 10.961 S.D.	25.148 11.515 S.D.	26.667 11.324 S.D.	25.049 11.211

Table 4

Age, Time, and Total
Means and Standard Deviations
Of the ROL

	A ₁ (Nov.)	A ₂ (Jan.)	A ₃ (Mar.)	Total
C ₁ n=16	21.625 13.465 S.D.	22.750 13.753 S.D.	24.125 13.861 S.D.	22.833 13.439
C ₂ n=19	21.684 9.650 S.D.	22.211 10.147 S.D.	24.948 9.395 S.D.	22.947 9.668
C ₃ n=21	22.667 9.473 S.D.	25.000 9.701 S.D.	27.286 8.850 S.D.	24.984 9.390
Total n=56	22.036* 10.621 S.D.	23.411* 11.004 S.D.	25.589* 10.565 S.D.	23.679 10.768

* significant at the .05 level.

The scores increased significantly from observation to observation. The mean for all 56 subjects at the first observation period was 22.036 (S.D.=10.621). The second observation yielded a mean of 23.411 (S.D.=11.004), and a mean of 25.589 (S.D.=10.565) was obtained at the final observation period. The total possible score on the ROL is 42. These increases are significant at the .05 level. The data from the ANOVA summary table on the ROL indicate that there was a significant difference in the scores obtained from each observation period (A₁, A₂, A₃). See Table 5. Therefore, the null hypothesis that there will be no

Table 5

Repeated Measures ANOVA Summary Table--ROL

Source	Sum of Squares	Degree of Freedom	Mean Squares	F Values	p Values
Between Subjects	18329.976	55.			
Sex (B ₁ , B ₂)	216.678	1.	216.6783	0.6111	0.43808
Age (C ₁ , C ₂ , C ₃)	112.262	2.	56.1308	0.1583	0.85402
Sex-Age	216.238	2.	108.1189	0.3049	0.73855
Error B	17729.214	50.	354.5843		
Within Subjects	1032.667	112.			
Time (A ₁ , A ₂ , A ₃)	319.362	2.	159.6809	26.1350	0.00000*
Sex-Time	11.706	2.	5.8528	0.9579	0.38717
Age-Time	23.664	4.	5.9161	0.9683	0.42842
Sex-Age-Time	21.279	4.	5.3197	0.8707	0.48438
Error W	610.985	100.	6.1099		

* significant at the .05 level

significant difference in performances on the ROL at each of the three observation periods was rejected.

The first question was answered in the affirmative: children's performances on the ROL did change as they proceeded through a traditional kindergarten. The children performed better over a period of time. The Newman-Keuls procedure was used to test the pair-wise comparisons of Factor A (Dayton, 1970, p. 104). The pairs tested were A_3 and A_1 , A_3 and A_2 , A_2 and A_1 . The means of these three observation periods differed significantly at the .05 level. The results of the pair-wise comparisons are shown in Table 6.

Table 6

Newman-Keuls Pair-Wise Comparisons
Of the Means of ROL Performances

Comparison	Critical Test Statistic	Computed Test Statistic
(1) $\bar{A}_3 - \bar{A}_1$	3.37	10.757*
(2) $\bar{A}_3 - \bar{A}_2$	2.84	6.594*
(3) $\bar{A}_2 - \bar{A}_1$	2.84	4.163*

* significant at the .05 level. n=56

Sex and Age. The means for the two sexes revealed a higher mean for all females at each observation period as compared to the males; however, this difference did not

prove to be significant at the .05 level. In general, the older children scored higher at each observation period than did the younger children. The trends of these means are shown in Tables 3 and 4.

The data do not support the rejection of the null hypotheses that there will be no differences in the scores obtained on the ROL for males vs. females and the three age groups. However, the means do indicate that, in general, females scored higher than males and that older children scored higher than did younger children. Question three was concerned with the influences of sex and chronological age on the performances on the ROL. The data indicate that there were no significant influences.

Sand Data

The raw data from the Sand were analyzed using the North Texas State University Statistical Library computer program ST024: three factor analysis of variance with repeated measures. Tables 7 and 8 present the means and standard deviations obtained for the various groups and subgroups. Question two was concerned with the kinds of changes in children's performances on the Sand test that take place as they proceed through a traditional kindergarten program.

The mean for all subjects at the first observation was 7.714 (S.D.=4.159) out of a possible score of 24.

Table 7
 Time, Sex, and Age Group
 Means and Standard Deviations
 For the Sand

		A ₁ (Nov.)	A ₂ (Jan.)	A ₃ (Mar.)	Total
B ₁ (Males)	C ₁ n=8	5.875 4.734 S.D.	7.000 4.629 S.D.	9.500 5.372 S.D.	7.458 4.952
	C ₂ n=13	7.077 3.730 S.D.	7.769 3.563 S.D.	9.385 4.273 S.D.	8.077 3.889
	C ₃ n=8	6.250 3.284 S.D.	8.250 2.605 S.D.	10.875 3.399 S.D.	8.458 3.551
	Total n=29	6.517 3.814 S.D.	7.690 3.567 S.D.	9.828 4.285 S.D.	8.011* 4.093
B ₂ (Females)	C ₁ n=8	6.250 3.576 S.D.	7.750 3.955 S.D.	9.875 4.224 S.D.	7.958 4.048
	C ₂ n=6	9.333 3.204 S.D.	10.833 1.941	12.167 3.251 S.D.	10.778 2.942
	C ₃ n=13	10.538 4.332 S.D.	11.385 4.234 S.D.	13.077 3.968 S.D.	11.667 4.201
	Total n=27	9.000 4.197 S.D.	10.186 3.981 S.D.	11.926 4.001 S.D.	10.370* 4.191

* significant at the .05 level

Table 8

Age, Time, and Total
Means and Standard Deviations
Of the Sand

	A ₁ (Nov.)	A ₂ (Jan.)	A ₃ (Mar.)	Total
C ₁ n=16	7.063 4.057 S.D.	7.375 4.177 S.D.	9.688 4.672 S.D.	7.708 4.481
C ₂ n=19	7.789 3.645 S.D.	8.737 3.413 S.D.	10.263 4.107 S.D.	8.930 3.807
C ₃ n=21	8.905 4.426 S.D.	10.190 3.945 S.D.	12.238 3.833 S.D.	10.444 4.242
Total n=56	7.714* 4.159 S.D.	8.893* 3.944 S.D.	10.839* 4.250 S.D.	9.149 4.294

*significant at the .05 level.

The second observation yielded a mean of 8.893 (S.D.=3.944) and a mean of 10.839 (S.D.=4.250) was obtained at the final observation period. These increases are significant at the .05 level. Therefore, the null hypothesis that there will be no significant difference in the performance on the Sand at each observation was rejected and the alternate hypothesis that there was a significant difference was accepted.

The data from the ANOVA summary table on the Sand indicate that there was a significant difference in the scores obtained for all subjects over the course of the three interview sessions. The ANOVA summary table is presented in Table 9.

Table 9

Repeated Measures ANOVA Summary Table--Sand

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Values	p Values
Between Subjects	2539.946	55.			
Sex (B ₁ , B ₂)	177.183	1.	177.1830	4.2468	0.04454*
Age (C ₁ , C ₂ , C ₃)	153.565	2.	76.7825	1.8403	0.16936
Sex-Age	53.643	2.	26.8213	0.6429	0.53008
Error B	2086.089	50.	41.7218		
Within Subjects	539.333	112			
Time (A ₁ , A ₂ , A ₃)	279.172	2.	139.5860	57.9015	0.00000*
Sex-Time	2.379	2.	1.1897	0.4935	0.61197
Age-Time	6.703	4.	7.6758	0.6952	0.59704
Sex-Age-Time	8.899	4.	2.2248	0.9229	0.45383
Error W	241.075	100.	2.4107		

* significant at the .05 level

The changes that took place were significant during the course of the observations. To test the significance of these changes the Newman-Keuls procedure was used for a pair-wise comparison of Factor A (Dayton, 1970, p. 104). The pairs tested were A_3 and A_1 , A_3 and A_2 , A_2 and A_1 . The means of these observation periods differed significantly at the .05 level. The results of the pair-wise comparisons are shown in Table 10.

Table 10

Newman-Keuls Pair-Wise Comparisons
Of the Means of Sand Performances

Comparison	Critical Test Statistic	Computed Test Statistic
(1) $\bar{A}_3 - \bar{A}_1$	3.37	15.062*
(2) $\bar{A}_3 - \bar{A}_2$	2.84	9.379*
(3) $\bar{A}_2 - \bar{A}_1$	2.84	5.682*

* significant at the .05 level. n=56

Sex and Age. There was also a significant difference in the scores obtained by the females as opposed to those obtained by the males. The females scored an average of 10.370 for all observations and the males scored 8.011 for the same observations. (See Table 7.) This difference was significant at the .05 level. Therefore, it can be concluded that females scored significantly higher on the

Sand than did the males. The null hypothesis that sex will not have a significant effect on the performances on the Sand was rejected and the alternate hypothesis that sex will have a significant effect on the Sand was accepted.

There were no significant differences obtained in the Sand scores when age was the variable being considered. See Tables 7 and 8 for the means and standard deviations. Therefore, the null hypothesis that age will not have a significant effect on the performances on the Sand was accepted. Question three was concerned with the influences of sex and chronological age on the children's performances on the Sand. Sex had a significant influence with the females scoring higher. Age did not have a significant influence but older children did tend to score higher.

Clay provides Stanine scores for the Sand test (1972b, p. 11). There may be a need at times to interpret the raw scores as Stanines. The Stanine scores for the raw scores obtained during this study are listed in Appendix G. Also listed are the Stanine scores obtained when considering Factors A and B.

Correlation of the ROL and the Sand

Question four of the study was interested in looking at the degree of relationship between the scores made on the ROL and those made on the Sand. Do those children who score high in oral language, as measured by the ROL,

also tend to score high on the Sand, which measures concepts about print? Is the reverse true? Do those children who score low on the ROL also score low on the Sand test? Also of interest was the relationship of the girls' scores as compared to the boys' scores.

The raw data were analyzed using the North Texas State University Statistical Library computer program ST006, which computes a simple correlation using the Pearson Product Moment Correlation. The scatter diagrams for the total group at each of the three interviews and for males and for females at each of the three interviews are presented in Appendix H.

The degree of relationship between the ROL and the Sand ranged from $r=0.61$ for the females at the first interview to $r=0.81$ for the females at the third interview. The degree of relationship for the males and the total group fell between these two extremes for all three interview sessions. The degree of relationship for all interviews (males, females, and total group) at the three different times appears to be significant. In general, if r falls between -0.30 and $+0.30$ there is, in all likelihood, no correlation or the correlation is meaningless. If the correlation is between $+0.30$ and $+0.60$ (-0.30 and -0.60), there is a possible correlation.

Finally, the correlation is probably meaningful if its value is greater than +0.60 (-0.60). The data collected for this study all show a correlation of +0.60 or better; therefore, the degree of relationship is probably meaningful.

To further test the degree of the relationship, a test of significance was performed on the data (Ferguson, 1971, p. 169). The formula used was

$$\underline{t} = r \sqrt{\frac{N - 2}{1 - \underline{r}^2}} \quad (1)$$

The proportion of variance accounted for in this relationship is \underline{r}^2 . Therefore, $1 - \underline{r}^2$ is not accounted for; it is the error variance. This \underline{t} -test was performed on the nine correlations listed in Table 11 and all were found to be significant at the .05 level of confidence.

As a result, the null hypothesis that there is no significant relationship of the scores between the ROL and the Sand was rejected and the alternate hypothesis was accepted. There is a significant relationship between oral language and concepts about print as measured by the ROL and the Sand. It was concluded that for this study children who scored high on the ROL were also likely to score high on the Sand, and those children who scored

Table 11

ROL/Sand Correlations
For Three Interview Sessions

	A ₁ (Nov.)	A ₂ (Jan.)	A ₃ (Mar.)
B ₁ B ₂ (males & females) n=56	$\underline{r}=0.6823^*$	$\underline{r}=0.7016^*$	$\underline{r}=0.7492^*$
B ₁ (males) n=29	$\underline{r}=0.7579^*$	$\underline{r}=0.7201^*$	$\underline{r}=0.7011^*$
B ₂ (females) n=27	$\underline{r}=0.6136^*$	$\underline{r}=0.6765^*$	$\underline{r}=0.8102^*$

*significant at the .05 level

low on the ROL were also likely to score low on the Sand.
Question four was answered in the affirmative.

Descriptive Data

Any research that involves working with children generates interesting data that cannot be statistically analyzed. As Piaget discovered years ago, sometimes the best way to find out how children think or what concepts they possess is to ask them or to look at their mistakes or "mis-responses".

Questions

In addition to the data generated from the administration of the ROL and Sand tests, the interviewer asked

the children a series of questions. The first two questions asked were "What is reading? What do we mean by reading?" (Jansky & de Hirsch, 1972, p. 169). The responses were rated as poor, fair, or good according to Jansky and de Hirsch's criteria:

Poor--I don't know. Child fails
to cope with the question.

Fair--the child associates
descriptively, i.e.,
reading a book, reading
a story.

Good--the child refers in some
manner to the correspondence
between written and spoken
words. (p. 169)

A poor response was given by 15 children at the first interview, 16 at the second, and by 11 at the third interview. Some children merely shrugged or simply did not respond to the questions. Several children responded that reading was fun.

The majority of children's responses fell into the fair category: 33 for the first and second interviews and 34 for the third. The usual response was "reading a story or book". Young children tend to define items in terms of their function (a hole is to dig); therefore, these responses are typical of children at this level.

A few children ($A_1=6$, $A_2=7$, $A_3=11$) gave responses that were rated as good. An example of this type of response is the child who said, "Means like you go to a library and check out a book and you don't just look at pictures--you read the words." Another child's response was, "Telling what the words say."

The children were then asked, "Do you want to learn how to read?" The majority of the children said that they did, but a few said no or did not respond ($A_1=4$, $A_2=3$, $A_3=6$). Then they were asked why they did (or did not) want to learn to read. Many of the responses fell into the category of wanting to learn to read so they could read their own stories and not have to ask someone to read to them, to read to a younger sibling or parent, or to help someone else learn to read. Some responses were future oriented. "If I didn't, I couldn't get no job when I grow up." One child responded, "So I can grow up and be a teacher and tell all the kids and read a story when I play school." Another child responded, "Cause I hate other people to read my stories." Another child said that her mother wants her to learn how to read. One child wanted to learn to read "Because I love it. I like to read."

Those who responded that they did not want to learn to read usually did not elaborate as to why not. A typical response was "Don't know" or "Just don't want to."

The next question asked of the children was "Can you read?" The majority of the children responded in the negative ($A_1=30$, $A_2=27$, $A_3=30$). A few children did not respond to the question. This question was interesting because those children who could read said "yes" and those children who were just beginning to learn to read said "yes" but they qualified it. Examples of qualified answers were "A little bit, two books." "Little words." They very often would iterate the words that they knew how to read. One child indicated that he knew how to say the words but that he could not read. One child told the interviewer that she (the interviewer) had taught him to read during the previous visit. A few children who did not know how to read indicated that they did. However, it would seem that if one wanted to know whether children know how to read, one could simply ask them. The majority of children seemed to know the reality of the situation.

Those children who responded to the above question in the affirmative were asked how they learned to read. The majority of them indicated that their mother taught them how by reading to them and telling them what the words were. Others mentioned who helped in the learning process were siblings, friends, teachers, and "my ownself." It is interesting to note here that fathers were never mentioned. Those few children who could read described

to the interviewer how they had learned. One girl said that her mother would read a page and then she would read the same page. She recalled the first book that she learned to read was Cinderella.

Reading A Book

Before the interviews were terminated, the children were given the option of reading a story by themselves for the interviewer. See Appendix E for the list of books available to the children. Approximately half of the children chose to read ($A_1=28$, $A_2=29$, $A_3=31$). Those children who had been identified as readers or who the interviewer thought might be able to read were asked to read the paragraphs in the Silvaroli book (1974). Except for those very few children who were reading, most of the children told the story based on the picture cues. In fact, most of them did not appear to notice the print.

The stories ranged from a one-word response per page to "talking like a book" (Clay, 1972a), to elaborate, involved plots. The numbers in parentheses following each selection in Appendix E indicate how many children selected that story to read. Some children read more than one story.

ROL

The children's responses on the ROL were interesting. Some sentences were not repeated correctly more often than

others. One common tendency was to use contractions, i.e., Mary is became Mary's. Those few children with articulation problems did not perform as well. A few children appeared to have language disorders and these children had difficulty with the sentences. The children seemed to reveal their inability to repeat the sentences by the forms that they substituted, i.e., Her driving for She's driving.

Sand Items

The individual responses to the Sand items were extremely interesting. Table 12 indicates the number of children who responded correctly to that particular item. See Appendix B for a more detailed description of the items.

All children knew the front vs. the back of the book (item #1) and the majority of children knew that the print carries the message (item #2). A few children pointed to the picture when asked to show the interviewer where to start reading. Even at the last observation period, not all children were able to demonstrate directional rules (items #3, 4, and 5). Again, many children pointed to the picture or pointed vaguely in the direction of the print. Some children indicated that they read from right to left or that they read left to right and then right

Table 12
Sand Item Responses

Item #	A ₁	A ₂	A ₃
1	56	55	56
2	46	51	51
3	27	33	42
4	22	31	44
5	19	30	40
6	0	18	21
7	22	37	40
8	38	31	44
9	14	14	19
10	3	1	4
11	44	47	46
12	0	1	0
13	1	1	2
14	0	0	1
15	7	3	2
16	12	13	18
17	1	0	0
18	0	0	0
19	23	32	38
20	4	4	8
21	37	45	49
22	16	11	27
23	22	27	35
24	13	10	20

n = 56

to left on the next line. Another frequent response was to turn the page when asked "Where do I go after that?"

By the time of the third observation slightly more than a third of the children could point to the words as the interviewer read them (item #6). Many children pointed to the picture or did not respond. A few pointed to the page number. Some children pointed to the print but could not make that one-to-one correspondence.

A number of the children had difficulty with the first and last part of the story (item #7). Again, many pointed to the picture; some indicated the front and the back of the book.

Many children commented on the inversion of the picture (item #8). Those who did not receive credit for this item frequently indicated the top of the picture which would normally be the bottom. Few children could respond to the question concerning directionality when the print was inverted (item #9). Most responded as if the print were not inverted. However, two children read it upside down.

Most children could correctly indicate that a left page is read before a right page (item #11). Those that did not respond correctly frequently pointed to the picture.

Items 10, 12, 13, and 14 have to do with a change in the sequence of lines, words, or letters. The lines of print are reversed in item 10.

and I splashed with my feet.

I jumped in the hole

The text for item 12 reads "I sat the in hole and I splashed my with feet." Item 13 has four letter reorderings and the children must notice any one to receive credit. The reorderings are shown below:

I sat ni eth hole

and I wondered.

Could a boat float heer?

Could a whale wsim here?

Item 14 also had letters in words reordered, i.e., "mkae, hlil, yelolw." Few children noticed these changes. In fact, those children who could read (some of them read the Sand rather than the interviewer) read those pages correctly and could not identify the error when asked "what's wrong on this page?" Obviously one can be a reader and yet not notice these kinds of errors.

Punctuation functions or names (items #15, 16, 17, and 18) were not known to many children. In fact, not one child knew what quotation marks were or what their purpose was. Common responses for these items were shrugs or "I don't know." Other responses included "for the

picture," "for the ending," "for the start." It would appear that knowing punctuation either by name or function did not hinder those children who are reading.

The ability to match capital and lower case letters increased during the time span of this study (item #19). Fewer children required a demonstration at the time of the third observation. A common error was the choice of the double l (ll) for the H.

Few children could point out the words no and was after that page had been read (item #20). An interesting observation was that many children could verbally spell no but were unable to select it from the other words. Frequent choices were on and oh. A number of children pointed to the picture rather than the print. A few children found the letters n and o embedded in the word another.

Items 21, 22, and 23 required the children to distinguish one and two letters, one and two words, and first and last letters of a word. The majority of children could perform the first task. However, some children responded by showing a word instead of a letter. In fact, one of the fluent readers responded in this manner. When asked to indicate one word, he indicated the sentence and replied that there were not two words (sentences). A frequent response to "Show me one word. Show me two

words" was to show the investigator one letter and two letters.

Confusions still exist concerning the first and last letters of a word. A number of those who did respond correctly to this item indicated the first letter (T) and the last letter (e.) of the sentence. A few children indicated the period as being the last letter of a word. Evidently there is still some confusion as to what is a letter and what is not. Fewer than a third of the children could select the capital letter (item #24).

The responses to the Concepts About Print test were varied and extremely interesting. Obviously some basic confusions do exist for this group of kindergarten children. Some do not realize that print rather than pictures carries the message. They are unclear about directionality rules and their concepts of a letter and a word are not always clear. Punctuation would appear not to have much meaning for them at this time.

Readers and Nonreaders

Two of the 56 subjects were fluent readers. They were subjects #7 and #53. These two children appeared to have no difficulty in reading the paragraphs for oral reading in Silvaroli's book (1973) at 85% accuracy or better. In fact, subject #53 read the eighth level

paragraph. She did not know several of the big words, but she continued. Subject #7 read the fourth level paragraph with ease at the last observation. Both of these children also read a trade book independently and read the Sand test.

Two other subjects (#20 and #50) met the criteria (85% accuracy) for being a reader at the last observation. Several other children seemed to be on the verge of reading but did not quite meet the criteria; these were subjects #37, #46, and #54.

These seven children averaged 14.57 on the Sand and 33.62 on the ROL which are above the average means of 9.15 and 23.67 for these two data collecting instruments. Four of them also happened to be in the oldest age category and five of them were females. Others who appeared to be beginning to move into print were #42, #45, #49, and #52.

It would appear that those children in this study who were reading or who were on the verge of moving into print had internalized more concepts about print than had non-readers. Their oral language as measured by the ROL was also more advanced.

Table 13 indicates how many children received credit for an item at the last observation. Also noted is the number of children who were reading or were on the verge of reading who received credit for that item.

Table 13

Sand Item Responses
Of All Subjects and Readers

Item #	A_3 All Subjects	A_3 Readers
1	56	11
2	51	11
3	42	11
4	44	11
5	40	11
6	21	10
7	40	11
8	44	11
9	19	10
10	4	3
11	46	11
12	0	0
13	2	2
14	1	1
15	2	1
16	18	6
17	0	0
18	0	0
19	38	11
20	8	5
21	49	9
22	27	8
23	35	9
24	20	8
	n = 56	n = 11

All but one of the children who were reading (or almost reading) were able to point to the words while the examiner read them (item #6). Only 21 of the 56 children were able to do this at the last observation. Of the 19 children who were able to indicate the correct direction of inverted print, 10 of them were in the group of readers (item #9). Three of the four children who knew which line should be read first (item #10) were included in the group of readers. Only one (item #13) and two (item #14) of the readers indicated that letters had been reordered.

The group of readers accounted for the majority of those children who knew the function or name of punctuation marks (items #15-18). Of the eight children who could find was and no in the text, five of them were readers. Eight (#22 and #24) and nine (#21 and #23) of the readers were able to show the examiner one and two letters and words, first and last letter of a word, and a capital letter (items #21, 22, 23, and 24.) It is interesting to note that the two fluent readers indicated words when asked to show one and two letters (item #21).

The results of this study indicate that kindergarten children have widely different abilities in oral language development and in their concepts about print. One could suppose that when they enter first grade and begin formal reading instruction, these children will be on very different cognitive entry levels. They certainly do not,

at this point in time, all possess the same cognitive entry behaviors (Bloom, 1976).

In summary, the statistical analyses revealed that there were significant (at the .05 level) increases in the means of the ROL and the Sand at each observation period. In addition, the females scored significantly higher on the Sand than did the males; however, sex was not a significant factor in the scores of the ROL. Chronological age was not significant for either the ROL or the Sand. The measures were positively correlated; this correlation was significant at the .05 level.

The descriptive analysis revealed that those children who were reading or on the verge of moving into print scored higher on both instruments than did the other children. Those children who were reading or almost reading were also able to point to the words while the investigator read them. Those children were also able to respond correctly to inverted print. Those children who were reading or on the verge of moving into print had more concepts about print, as measured by the Sand, than those children who did not appear to be moving into print at this time.

CHAPTER V

Summary and Discussion

Summary

Summary of Investigation

This study was undertaken to observe children's development of oral language and concepts about print during their progress through a traditional kindergarten. The relationship between language and print was also of interest to the investigator.

From a suburban north central Texas school district, 75 kindergarten children from four elementary schools were randomly selected to participate in the study. The final sample consisted of 56 children, 29 of whom were males and 27 of whom were females. The children were assigned to one of three age groups according to their age at the time of the first observation.

The children were interviewed individually by the investigator in November, January, and March. The Levels Sentences of the Record of Oral Language (ROL) were used to assess the children's oral language (Clay et al., 1976b). Clay's (1972b) Concepts About Print or Sand test was used to gather information about the children's early reading behaviors or concepts concerning print. The order of administration of these two instruments was alternated to

avoid any bias. All sessions were recorded to check for accuracy and for future reference. The children were also asked a series of questions. They were as follows:

1. What is reading?
2. What do we mean by reading?

The responses to these two questions were rated according to Jansky and de Hirsch's criteria (1972, p. 169). In addition, the children were asked these questions:

3. Do you want to learn to read?
4. Why do (don't) you want to learn to read?
5. Can you read?
6. If question five was answered in the affirmative, the children were asked how they learned to read.

In addition, all children were given the opportunity to read independently for the investigator. Selections for the independent reading consisted of trade books and several preprimers, primers, and graded paragraphs (see Appendix #).

Summary of Findings

This study consisted of an experimental and a descriptive aspect. The specific questions that guided the experimental aspect were as follows:

1. Do children's performances on the ROL change as they proceed through a traditional kindergarten program? If so, what kinds of changes take place?

The results of this study indicated that children's performances on the ROL do change during the course of the kindergarten year. These changes were significant at the .05 level for this study. The mean number of sentences that the children were able to repeat at each observation period increased.

2. Do children's performances on the Sand change as they proceed through a traditional kindergarten program? Is so, what kinds of changes take place?

The results of this study indicated that children's performances on the Sand do change during the course of the kindergarten year. The mean score obtained on the Sand increased significantly at each observation period. This increase was significant at better than the .05 level.

3. What influences do sex and age have on the performances on the ROL and the Sand test?

Sex did not have an influence on the performances of the subjects on the ROL. The means for the two groups (males and females) show that the females did achieve a higher mean at each observation period; however, this higher mean for the females was not statistically significant.

Sex did have an influence on the performances of the subjects on the Sand. The females obtained a significantly higher mean at each of the three observation periods.

Age did not have a significant influence on either the ROL or Sand at any of the three observation periods. However, the means do indicate that the older children scored better, in general, than did the younger children.

4. Are the scores on the ROL and the Sand related?

The scores of the ROL and the Sand were positively related to each other at each of the three observation periods. These correlations ranged from 0.61 to 0.81 and were significant at the .05 level.

The descriptive aspect of this study was concerned with the differences between the nonreaders and the readers which included those children on the verge of moving into print. Individual responses to the Sand items were reviewed as well as responses to the interview questions concerning reading and are included in the following section.

Discussion

The results of the present study are in agreement with earlier studies (Loban, 1963, Strickland, 1962) which emphasized the importance of the relationship between oral language and reading with subsequent implications for academic success. In general, those children who scored higher on a measure of oral language ability (ROL) also scored higher on a measure of concepts about print (Sand test).

A common error on the ROL was the substitution of a contraction for the uncontracted form. Clay et al. (1976b) indicates that the child must repeat a sentence exactly as he heard it to receive credit for that item. Perhaps errors of this kind need to be checked closely to see if the child does indeed have control over that grammatical structure. The substitution of "She's" for "She is" does not seem nearly as serious as "Him playing him radio." If one considered the family and home background of these children, it appears that those children from a higher socio-economic level score higher on the ROL.

There was a positive relationship between the scores obtained on the ROL and the Sand. The degree of relationship increased during the course of the study. However, if one analyzes the changes, one can see that it is the females who accounted for this change. Their initial correlation was 0.61 and increased to 0.81 for the final observation. The boys' correlation showed a decrease from 0.76 to 0.70. The girls' scores accounted for the increased degree of relationship of these two measures.

Bloom (1976) raises the question of "cognitive entry behaviors" of children when they approach a learning situation (p. 30). He feels that children will have difficulty with a task if they do not possess the

prerequisite behaviors for that task. He goes on to state that the most critical behaviors are those that come first. How can a teacher assess the "cognitive entry behaviors of her young students as they begin the reading process? What skills or concepts must they have in order to deal effectively and efficiently with beginning reading instruction?

Perhaps the Sand test is one means of assessing the early concepts that children have. The sample for this study included two fluent readers, two beginning readers, and seven other children who seemed to be on the verge of moving into print. This investigator feels that the Sand does provide a means for assessing the early reading behaviors of children. Those 11 children who were reading, or on the verge of reading, seemed to have certain concepts which many of the other children did not have.

One of the items that seemed to differentiate the two groups was the word-by-word pointing while the investigator read the story. Ten of the 11 children could do this and the 11th child almost achieved this task. They accounted for half of the 21 children who accomplished this task. They also accounted for half of the 19 children who could respond correctly to inverted print. Even though the print was upside down, they still knew where to start and in what direction to proceed. This group of readers also

accounted for most of those very few children who responded correctly to reversed letters, words, and lines, as well as punctuation.

Clay (1972b) states that, "If the child fails item 10, items 12-20 are likely to be failed and can be given at the discretion of the examiner" (p. 10-11). This study appears to support that statement with the possible exception of item 19 where the child is asked to locate two pairs of upper and lower case letters. There were 38 children (including the 11 readers) who were able to respond to this question correctly at the last observation. For the other items, the readers accounted for the majority of those very few children who responded correctly.

Even the fluent readers did not know all the punctuation marks, nor were they able to identify word and letter reversals. The concepts that were not known by virtually all of the children were name and/or function of the question mark, period, comma, and quotation marks. Others included letter reversals (eth, huose), word reversals (I splashed my with feet), and line reversals

and I splashed with my feet.

I jumped in the hole

Obviously these concepts do not appear to be critical for learning to read. Perhaps too much weight is give them in this instrument.

The wording of one or two items may be confusing to the children rather than the concept itself. Item 7 requests that the child indicate the first and last part of the story, meaning the text that is printed on that one page. A number of the children indicated the front and back of the book. The word story may be confusing to them. More probing would be necessary to accurately assess item 7.

Only about a third of the children could show the investigator a capital letter. Some of these children may be used to calling a capital letter by some other name (i.e., upper-case letter, or big letter).

This study indicated that females had significantly more concepts about print than did males. Perhaps this is an indication that closer attention should be paid to the cognitive learning styles of boys and girls. Perhaps with appropriate experiences, which may be different from those experiences necessary for females, males could perform as well on the Sand.

It would seem plausible that young children would need to have information about the concepts that the Sand tests before they could be successful in a beginning reading program, but which ones seem most necessary? This study seemed to indicate a few of those items which the readers knew and those which nonreaders did not. If

certain concepts can be discovered to be the "cognitive entry behaviors" to success in reading, perhaps a kindergarten program could be developed which would provide the children who did not have these concepts with the experiences which lead to their formation.

When asked the questions "What is reading? What do we mean by reading?", most of the subjects gave answers that were rated fair. A typical answer in this category was "Reading a book." A few children at each observation period (six, seven, and 11) gave an answer that associated the printed word with a spoken word. This type of response was rated as good. There were still 11 children in this study who did not cope with or answer these questions at the final interview.

The majority of the children who participated in this study wanted to learn to read. However, there were six at the time of the last interview who either did not want to learn to read or who did not respond to the question. One might conclude, therefore, that not all kindergarten children in this study wanted to learn to read. If a child does not want to learn to read, how successful will reading instruction be?

Most of the kindergarten children appeared to know whether or not they could read and, more surprisingly, how well. Several of the children who appeared to be

on the verge of moving into print were able to list at least some of the words they knew how to read. The majority of children responded that they did not know how to read. These children appeared to do remarkably well at judging their own reading abilities. Those few children who were reading were able to recall how they learned to read. The "lap method" appeared to be the predominant way most of these children learned to read.

It is interesting to speculate concerning the early experiences of these children and the effects they have on their present performances on the Sand test. The families of these 56 children were interviewed extensively by J. Smith (1978). Interesting information generated by J. Smith's study concerning environmental factors of these children is revealing. Three of the 17 factors were concerned with economic pressure, parental availability, and previous nursery school experience of those children involved in this study. Of the 56 children participating in this study, 11 of them (20%) were from homes where there was no economic pressure (incomes were high); 28 (50%) of the children were from homes with average economic pressure; and 17 (30%) were from homes with high economic pressure. A parent was available in the home when the child was there in 37 of these homes. For 19 of these children, there was not a parent available, and the child

usually was in some type of child care situation. Thirty-five of these children had had nursery school or prekindergarten experiences and 21 had not. See Appendix I for a cross reference of children participating in this study and the families participating in J. Smith's study (1978).

Conclusions

Within the limitations of this study, the following conclusions would appear to be justified.

1. Children do not all have the same concepts of print.
2. The majority of children progress in their oral language and concepts about print during the course of a traditional kindergarten program.
3. Not all children progress at a steady pace in oral language and concepts about print.
4. Children who are reading, or almost reading, possess more concepts about print as measured by the Sand than those children who are not reading.
5. There is an indication that certain concepts about print are more important for reading than others.
6. Females are more advanced in their concepts about print than are males.
7. There is a significant, positive relationship

between the performance of language development (ROL) and Concepts About Print (Sand).

Implications

Considering the limitations of this study, it would appear that the following implications are appropriate.

Not all children at the kindergarten level have attained the same level of cognitive entry behaviors for the reading task. Teachers cannot assume that all children are functioning at the same level in their ability to deal with print. The Sand is one possible means for assessing these behaviors.

Even though most children made progress in their oral language development and concepts about print, not all children did. Perhaps children who made little or no progress and those who were extremely low to start with would benefit from a program that made an effort to foster development in these two areas.

For example, one school district in the Fairfax County Schools is using a readiness checklist which utilizes the ideas of Clay concerning concepts about print (McDonnell & Osburn, 1978). Several teachers in the school system decided to use a checklist which incorporated Clay's ideas to assess readiness for reading. They have found their checklist helpful for diagnosing weaknesses in certain areas but not for direct teaching of any particular concept.

If there are some concepts of print that are prerequisite tasks to reading, perhaps experimentation with alternative programs can be considered. Teachers should strive to provide a learning situation in which all children can develop their oral language and concepts about print. However, the situation may not be the same for all children (i.e., males and females).

Recommendations for Further Study

This study provides insights into the concepts that children possess about the beginning reading process; these results should be confirmed through replicative research. Further research should be conducted to determine which concepts are necessary for children to have before they begin a successful entry into the reading process.

The experiences that children have before entry into school should be carefully studied. How is it that some children acquire these concepts and others do not? (See J. Smith, 1978, for a more complete discussion.)

Reading is a complex process that has many variables entering into that process. Careful study of all aspects needs to be conducted. Experimentation should be encouraged to see how teachers of young children can facilitate early reading behavior.

The children that participated in this study should be followed and their progress in reading and language

should be observed. Perhaps in this way, the predictive value of the instruments could be determined.

This study should be replicated with the initial observation being in September soon after the children begin the kindergarten year. The children should be observed again during the year with a final observation taking place at the close of the school year. Perhaps studies of this type will let teachers of young children begin to see just which children seem to need no special help and which children will need special programs to support their entry into reading.

APPENDICES

APPENDIX A

Levels Sentences

Class: _____ School: _____ Child's Name: _____
 Date: _____ Date of Birth: _____ I.D. #: _____
 Recorder: _____ Age: _____ Teacher: _____
 Sex: _____ Ethnic Group: _____

THE LEVELS SENTENCES

Level 2 Part 1 Type	Level 2 Part 2 Type
A <u>That big dog over there</u> is going to be <u>my brother's</u> . _____	<input type="checkbox"/> A <u>That old truck in there</u> used to be <u>my father's</u> . <input type="checkbox"/> _____
B <u>The boy by the pond</u> was sailing <u>his boat</u> . _____	<input type="checkbox"/> B <u>The cat from next door</u> was chasing <u>a bird</u> . <input type="checkbox"/> _____
C <u>The bird flew</u> to the top of the tree. _____	<input type="checkbox"/> C <u>The dog ran through</u> the hole in the fence. <input type="checkbox"/> _____
D <u>For his birthday</u> Kelly gave him <u>a truck</u> . _____	<input type="checkbox"/> D <u>For the holidays</u> Grandpa bought us a ball. <input type="checkbox"/> _____
E. <u>Can you see what is climbing up the wall?</u> _____	<input type="checkbox"/> E <u>The boy saw</u> what the man was doing <u>to the car</u> . <input type="checkbox"/> _____
F <u>Here comes a big elephant</u> with children sitting on his back: _____	<input type="checkbox"/> F <u>There is my baby</u> riding in his stroller. <input type="checkbox"/> _____
G <u>My brother turned the radio up</u> very loud. _____	<input type="checkbox"/> G <u>The girl threw her book</u> right across the room. <input type="checkbox"/> _____

Total for Level 2
 Enter 14 on the next page if all Level is credited.

Level 1 Part 1
Type

A My brother's knees are dirty.

B Kitty is drinking some milk.

C Sally is staying at home.

D John is buying me a boat.

E I know he's in there.

F There's another fire engine.

G She's driving her car quickly.

Level 1 Part 2
Type

A My father's radio is broken.

B Sally is riding her bike.

C Mary is going to town.

D Mary is giving me a book.

E I guess we're lost.

F Here are some more fish.

G He's playing his radio very loud.

Total for Level 1

Level 3 Part 1
Type

A Be as quiet as you can when your father's asleep.

B My aunt and uncle want to start building a new house.

C The two cars drove along the road for a long time.

D The shopkeeper sold my mommy some fresh cream.

E The girl saw who her mother was giving the cakes to.

F There are the books that you were reading at my place.

G My mother usually puts the cat outside the house at night.

Level 3 Part 2
Type

A Be very careful swimming when there's a big wave.

B That dog and the one next door like to chase the mailman.

C All the children talked loudly to each other at the table.

D The new teacher read our class a fairy story.

E The teacher knows how much wood we will need for the house.

F There goes the fireman who put out the fire in the factory.

G My brother often puts some bread outside for the birds.

+12 go to Level 3
3-11 go to Level 1 and then Level 3
0-2 go to Level 1 and STOP

Total for Level 3
Level 1
Level 2
Grand Total

APPENDIX B

Concepts About Print

(Sand)

CONCEPTS ABOUT PRINT

Child's name: _____ School: _____ Teacher: _____

"I'm going to read you this story but I want you to help me."

Item #	+,-	Page #	Question Asked	Concept
1	---		Show me the front of this book.	Orientation of book.
2	---	2/3	I'll read you this story. You help. Show me where to start reading. (read text)	Print carries message.
3	---	4/5	Show me where to start? (top L.)	Directional rules.
4	---	"	Which way do I go? (L - R)	" "
5	---	"	Where do I go after that? (return sweep to L)	" "
6	---	"	Point to it while I read.	Word by word pointing.
7	---	6	Read text. *Show me the first part of the story. Show me the last part.	First and last.
8	---	7	Show me the bottom of the picture.	Inversion of picture.
9	---	8/9	Where do I begin? Which way do I go? Where do I go after that? (read)	Response to inverted Print.
10	---	10/11	What's wrong with this? (read bottom line first, then top)	Line sequence.
11	---	12/13	Where do I start reading?	L. page read before R. page.
12	---	"	What's wrong on this page? (12) (read as if correct)	Word sequence incorrect.
13	---	"	What's wrong on this page? (13) (read as if correct)	Letter order incorrect

<u>Item #</u>	<u>Page #</u>	<u>Question Asked</u>	<u>Concept</u>
14	14/15	What's wrong on this page? (read as if correct)	Reordering letters.
15	"	What's this for? (?)	Question mark: function or name
16	16/17	Read text. What's this for? (.)	Punctuation
17	"	What's this for? (,)	"
18	"	What's this for? (")	"
19	"	*Find a little letter like this. (T, <u>M</u> , <u>H</u>)	Capital/lower case correspondence.
20	18/19	Read Text. *Show me <u>was</u> . Show me <u>no</u> .	Reversible words.
21	20	This story says: "..." *Now show me one letter. Two.	Letter.
22	"	*Show me just one word. Now show me two words.	Word.
23	"	*Show me the first letter of a word. Show me the last letter of a word.	First and last letter.
24	"	Show me a capital letter.	Capital letter.
TOTAL	_____	(correct)	

*Both required to be correct for one point credit.

APPENDIX C

Vocabulary Changes

Vocabulary Changes

In Levels Sentences

1. Pussy is drinking some milk. Change to
Kitty is drinking some milk.
2. For his birthday Kiri gave him a truck. Change to
For his birthday Kelly gave him a truck.
3. There is my baby riding in his pushchair. Change to
There is my baby riding in his stroller.
4. The shopkeeper sold my mummy some fresh cream. Change to
The shopkeeper sold my mommy some fresh cream.
5. My mother usually puts the cat under the house at night.
Change to
My mother usually puts the cat outside the house at night.
6. That dog and the one next door like to chase the postman.
Change to
That dog and the one next door like to chase the mailman.

Panel

The following people agreed that the changes made in the Levels Sentences were acceptable:

Dr. Turner S. Kobler, Ph. D. Department of English,
Texas Woman's University

Dr. Margaret M. Griffin, Ph. D. Department of Curriculum
and Instruction, Texas Woman's University

Mrs. Nancy Burris, doctoral student in reading, Texas
Woman's University

Mrs. Kaaren Perkins, doctoral student in early childhood
education, Texas Woman's University

APPENDIX D

Letter to Parents

TEXAS WOMAN'S UNIVERSITY

DENTON, TEXAS 76204



COLLEGE OF EDUCATION
DEPARTMENT OF CURRICULUM
AND INSTRUCTION
BOX 53029, TWU STATION

With the cooperation of the Independent School District, Texas Woman's University is investigating children's general language development. We would like your cooperation in participating in this study. Because the cost prevents us from including all 500 kindergarten children in we have scientifically selected a random sample of 50 children, was one of the 50 children selected to participate in this study, should you agree.

The study will be conducted by Mrs. Kaaren Perkins and Mr. John Smith during the next six months. It will include three observations of the children and one or two short visits with the parents of each child. The observations of the children will be conducted during school in the months of November, January, and March and will only be about 15 minutes in duration. The interaction between the investigators and the children will be fun activities and it will not be a stressful, threatening test situation. At no time will the study interfere with activities in the classroom. The visit or visits to your home should not last over 45 minutes and will be scheduled at your convenience: morning, afternoon, evening, weekday, or weekend.

We believe that the results of this study will be helpful to kindergarten teachers and parents in the future. Education is a complex process and we plan to follow-up this study to learn more about later school experiences. We need your help; please sign the enclosed form and return it in the stamped envelope enclosed for your convenience. If you have any questions, please call Mrs. Perkins (387-5495) or Mr. Smith (382-0200).

All information from this study will be held in the strictest confidence. Individual children, schools, and the School District will not be identified in the reports of this study.

Sincerely yours,

Rose Spicola
Dr. Rose Spicola
Program Director

TEXAS WOMAN'S UNIVERSITY

I hereby authorize Kaaren Perkins and John Smith to ask _____ questions of an educational nature and record the responses on magnetic tape. I understand that the information may be used for educational and research purposes; and do hereby consent to such use.

In addition the investigators are authorized to contact me for purposes of making an appointment to visit my home to collect additional information. I understand that the visit will be schedule at my convenience and that all information will be held in strictest confidence.

Parent or Guardian

Date

APPENDIX E

Books Available to Read

SELECTION OF BOOKS TO READ

A₁, November, 1977

1. Classroom Reading Inventory by Nicholas J. Silvaroli. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1973. Form A, Part II--Classroom Reading Inventory, oral selections: PP, P, 1, 2, 3, 4, 5, 6, 7, 8. (4)
2. Tigers. Lions. Dinosaurs. Boston: Houghton Mifflin Company, 1971. (5)
3. Great Day for Up by Dr. Seuss. New York: Random House, Inc., 1974. (13)
4. The Littlest Rabbit by Robert Kraus. New York: Scholastic Book Services, 1961. (7)
5. Where Does the Butterfly Go When it Rains by May Garelick. New York: Scholastic Book Services, 1961. (1)

A₂, January, 1978

1. Classroom Reading Inventory by Nicholas J. Silvaroli. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1973. Form B, Part II--Classroom Reading Inventory, Oral selections: PP, P, 1, 2, 3, 4, 5, 6, 7, 8. (8)
- 2, Places and Puzzles. New York: Harper & Row, Publishers, 1976. (2)

3. In the Forest by Marie Hall Ets. New York:
Scholastic Book Services, 1944. (4)
4. Madeline by Ludwig Bemelmans. New York: Scholastic
Book Services, 1939. (6)
5. The Snowy Day by Ezra Jack Keats. New York:
Scholastic Book Services, 1962. (3)
6. ABC: An Alphabet Book by Thomas Matthiesen.
New York: Platt & Munck, Publishers, 1966. (11)

A₃, March, 1978

1. Classroom Reading Inventory by Nicholas J.
Silvaroli. Dubuque, Iowa: Wm. C. Brown Company
Publishers, 1973. Form C, Part II--Classroom
Reading Inventory, oral selections: PP, P, 1, 2,
3, 4, 5, 6, 7, 8. (10)
2. Hop Like a Bunny, Dance Like a Bear! by Ed Cunning-
ham. Kansas City: Hallmark Children's Editions,
Hallmark, Cards, Inc. (10)
3. The Poky Little Puppy from Golden Books. Racine,
Wisconsin: Golden Press, Western Publishing
Company, Inc., 1972. (9)
4. The Witch Next Door by Norman Bridwell. New York:
Scholastic Book Services, 1965. (10)

APPENDIX F

Raw Data

Raw Data
ROL/Sand Scores

Subjects (B_1 , males)		ROL			<u>Sand</u>		
C_1 (5-3 through 5-6)		A_1	A_2	A_3	A_1	A_2	A_3
1	(5-3)	36	37	39	8	8	12
2	(5-3)	33	27	33	6	8	13
3	(5-3)	8	10	18	3	4	9
4	(5-3)	6	8	10	1	4	2
5	(5-4)	9	13	12	1	3	4
6	(5-6)	26	33	34	13	12	14
7	(5-6)	30	32	35	12	15	17
8	(5-6)	1	0	0	3	2	5
C_2 (5-7 through 5-10)							
9	(5-7)	8	8	16	5	8	9
10	(5-7)	19	15	22	3	5	10
11	(5-7)	24	28	24	8	8	14
12	(5-7)	24	22	23	7	9	10
13	(5-7)	27	27	31	7	6	4
14	(5-8)	33	34	37	11	10	11
15	(5-8)	13	15	15	4	4	7
16	(5-9)	34	24	35	13	12	12
17	(5-9)	21	21	24	3	6	3
18	(5-9)	23	28	30	9	8	12
19	(5-9)	31	29	30	9	9	12
20	(5-10)	29	34	35	12	15	16
21	(5-10)	3	2	7	1	1	2
C_3 (5-11 through 6-3)							
22	(5-11)	18	16	24	11	11	14
23	(5-11)	29	32	33	10	7	14
24	(5-11)	10	13	14	4	9	9
25	(6-0)	11	17	23	3	4	4
26	(6-0)	29	33	31	6	9	11
27	(6-1)	31	34	32	9	12	14
28	(6-2)	22	24	25	3	8	11
29	(6-2)	16	16	21	4	6	10

Raw Data
ROL/Sand Scores

Subjects (B ₂ , females)	ROL			<u>Sand</u>		
C ₁ (5-3 through 5-6)	A ₁	A ₂	A ₃	A ₁	A ₂	A ₃
30 (5-3)	14	16	16	2	6	7
31 (5-3)	35	35	36	9	9	11
32 (5-3)	14	9	5	5	4	7
33 (5-4)	37	37	40	7	10	12
34 (5-5)	32	32	32	7	8	12
35 (5-5)	1	3	7	1	2	2
36 (5-6)	32	39	36	7	8	13
37 (5-6)	32	33	33	12	15	15
C ₂ (5-7 through 5-10)						
38 (5-7)	16	19	23	9	10	10
39 (5-8)	20	19	17	6	11	10
40 (5-8)	33	39	40	12	14	14
41 (5-8)	18	20	22	12	9	16
42 (5-9)	32	33	34	12	12	15
43 (5-10)	4	5	9	5	9	8
C ₃ (5-11 through 6-3)						
44 (5-11)	20	17	24	10	10	13
45 (5-11)	24	25	25	12	14	14
46 (5-11)	30	35	36	8	11	14
47 (5-11)	3	10	12	3	3	5
48 (5-11)	27	29	32	5	8	13
49 (6-0)	16	17	20	14	14	13
50 (6-0)	36	35	37	16	15	16
51 (6-1)	30	26	32	10	11	14
52 (6-1)	28	39	38	12	14	17
53 (6-2)	38	36	41	17	16	17
54 (6-2)	23	34	32	14	16	17
55 (6-2)	7	7	8	5	4	5
56 (6-3)	28	30	33	11	12	12

APPENDIX G

Stanine Scores

Stanine Scores

Subject Number	A ₁	A ₂	A ₃	Subject Number	A ₁	A ₂	A ₃
1	4	4	5	29	2	3	4
2	3	4	5	30	2	3	3
3	2	2	4	31	4	4	4
4	2	2	2	32	3	2	3
5	2	2	2	33	3	4	5
6	5	5	5	34	3	4	5
7	5	6	6	35	2	2	2
8	2	2	3	36	3	4	5
9	3	4	4	37	5	6	6
10	2	3	4	38	4	4	4
11	4	4	5	39	3	4	4
12	3	4	4	40	5	5	5
13	3	3	2	41	5	4	6
14	4	4	4	42	5	5	6
15	2	2	3	43	3	4	4
16	5	5	5	44	4	4	5
17	2	3	2	45	5	5	5
18	4	4	5	46	4	4	5
19	4	4	5	47	2	2	3
20	5	6	6	48	3	4	5
21	2	2	2	49	5	5	5
22	4	4	5	50	6	6	6
23	4	3	5	51	4	4	5
24	2	4	4	52	5	5	6
25	2	2	2	53	6	6	6
26	3	4	4	54	5	6	6
27	4	5	5	55	3	2	3
28	2	4	4	56	4	5	5

Stanine Scores

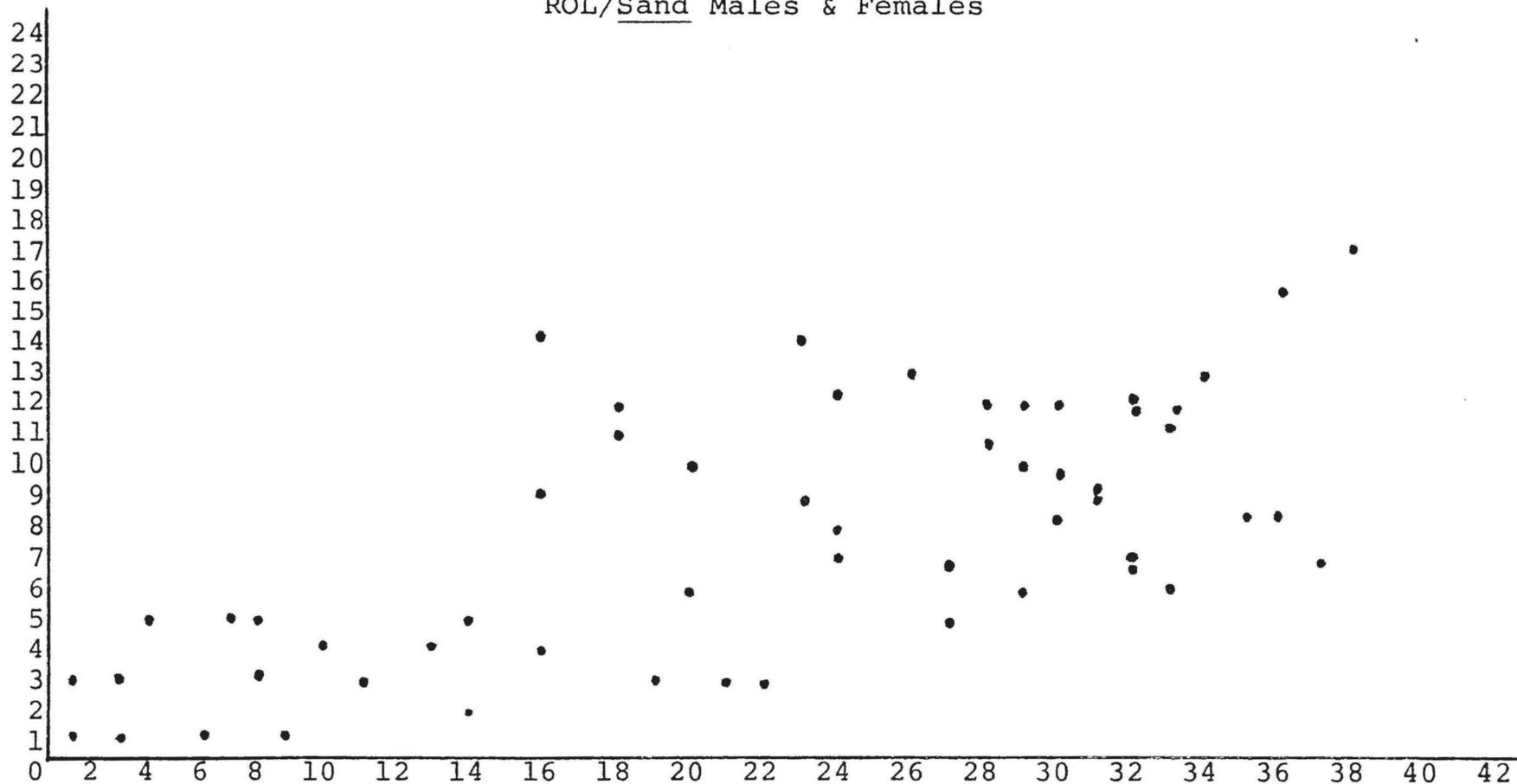
Stanine Score	Clay's Test Score	A_1		A_2		A_3	
		B_1	B_2	B_1	B_2	B_1	B_2
1	0	0	0	0	0	0	0
2	1-4	12	3	7	4	6	1
3	5-7	5	8	5	1	2	4
4	8-11	8	6	12	12	9	4
5	12-14	4	8	3	6	10	11
6	15-17	0	2	2	4	2	7
7	18-20	0	0	0	0	0	0
8	21-22	0	0	0	0	0	0
9	23-24	0	0	0	0	0	0
		n = 29	27	29	27	29	27

APPENDIX H

Scatter Diagrams
ROL/Sand

Figure 1

Scatter Diagram
ROL/Sand Males & Females



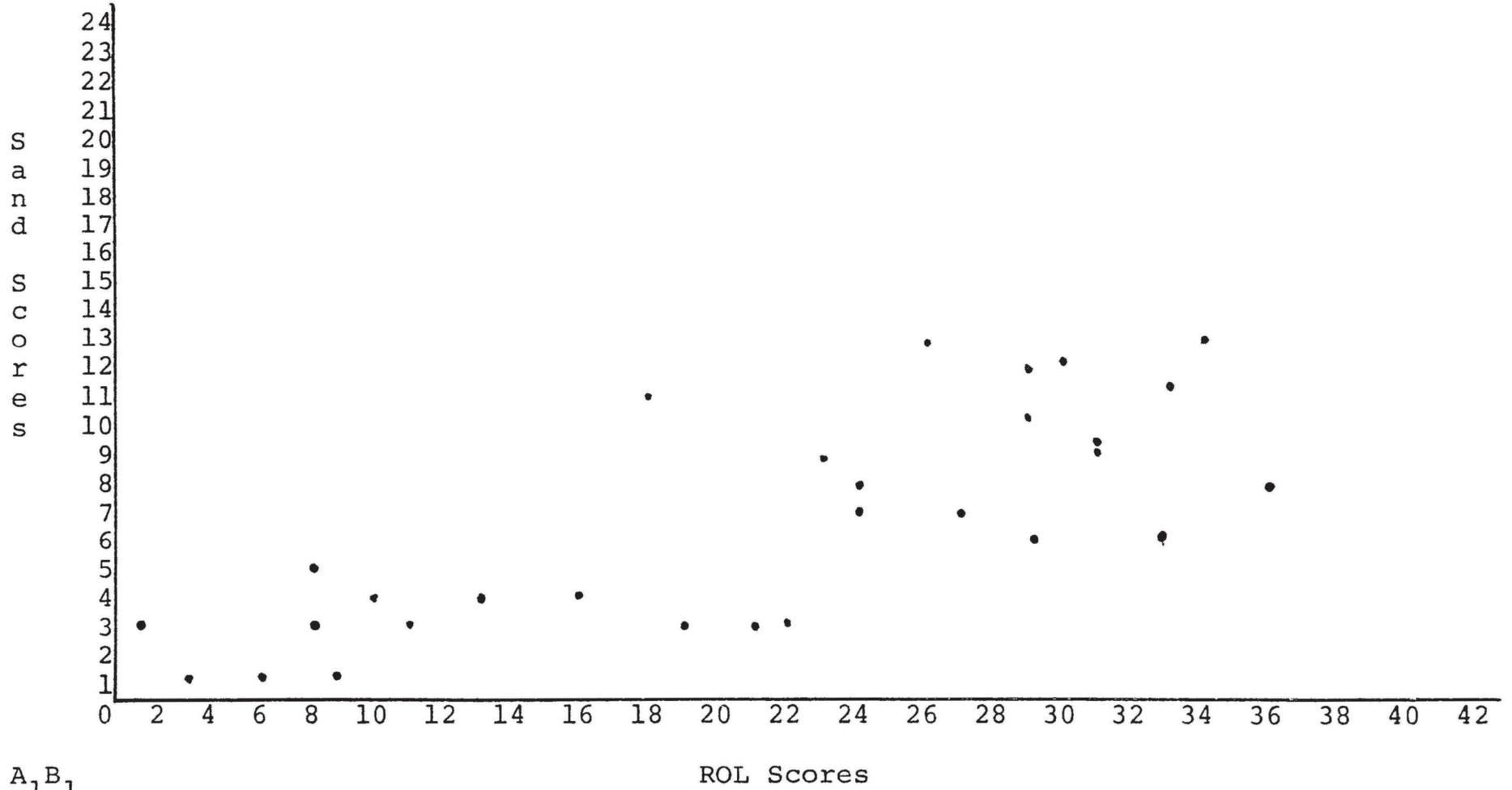
A₁B₁B₂

ROL Scores

n=56 $\underline{r}=0.68$ Significant at the .05 level.

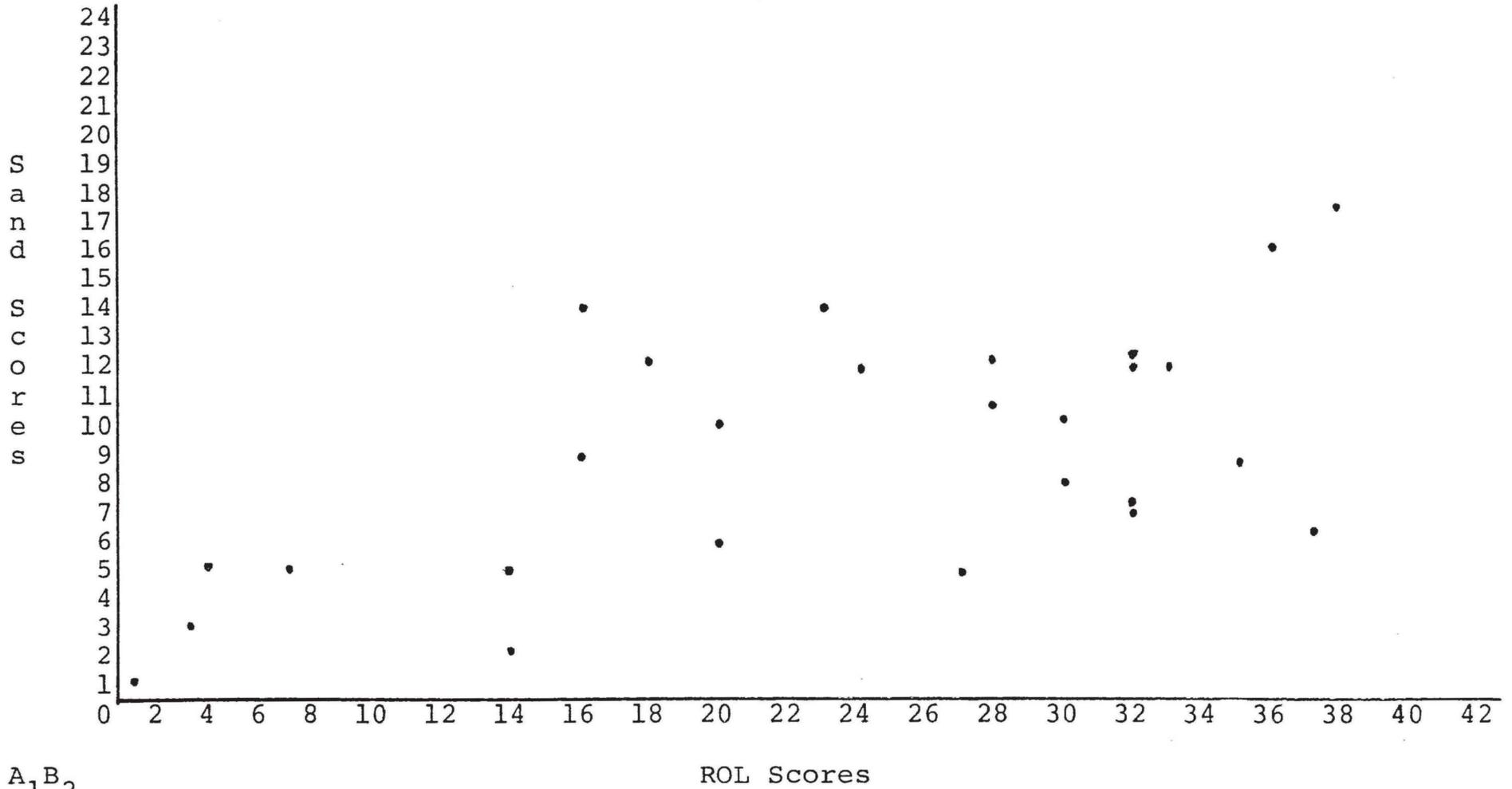
Figure 2

Scatter Diagram
ROL/Sand Males



A_1B_1
n=29 $r=0.76$ Significant at the .05 level.

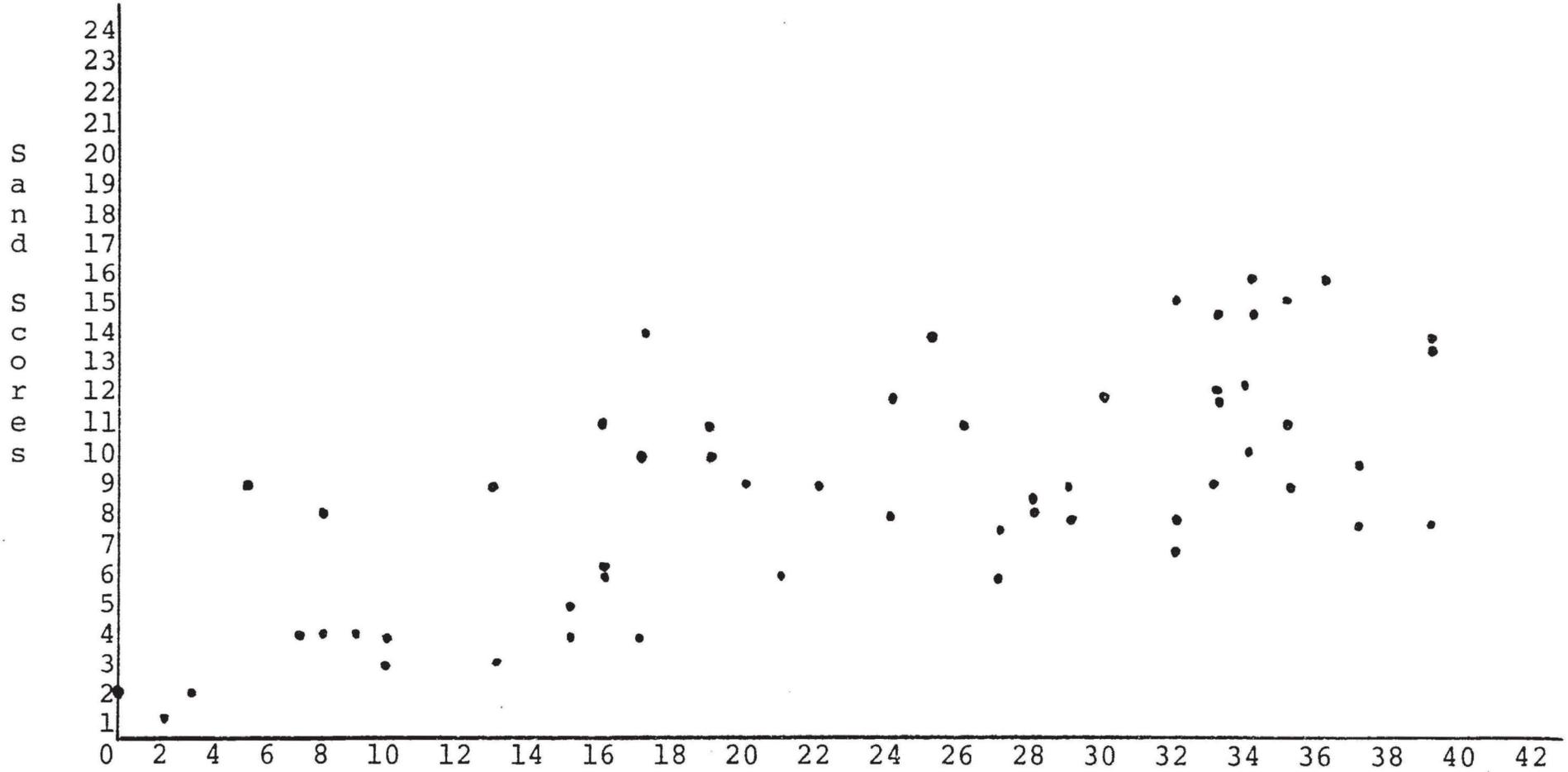
Figure 3
Scatter Diagram
ROL/Sand Females



A_1B_2 ROL Scores
n=27 $r=0.61$ Significant at the .05 level.

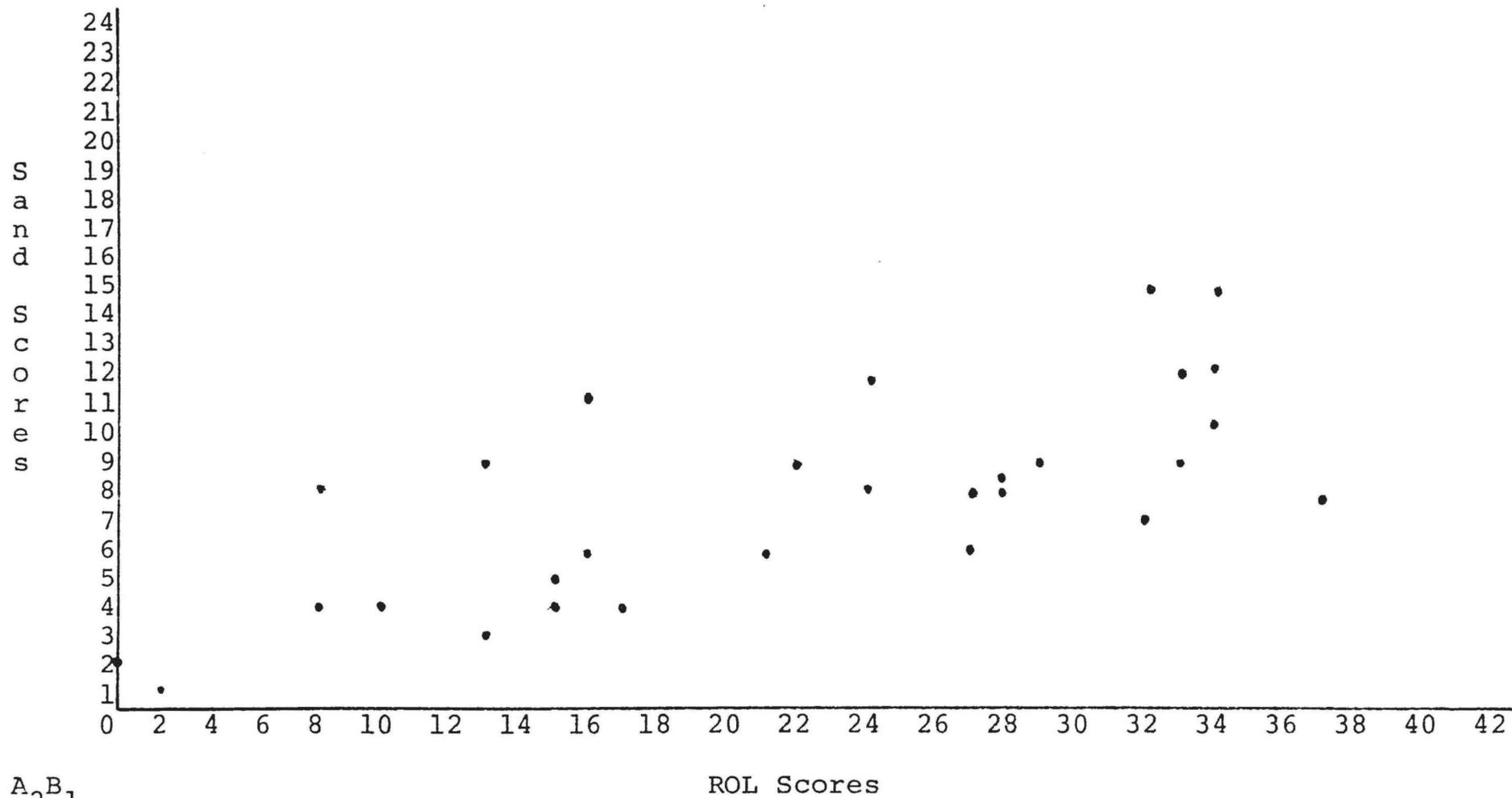
Figure 4

Scatter Diagram
ROL/Sand Males & Females



$A_2 B_1 B_2$ ROL Scores
n=56 $r=0.70$ Significant at the .05 level.

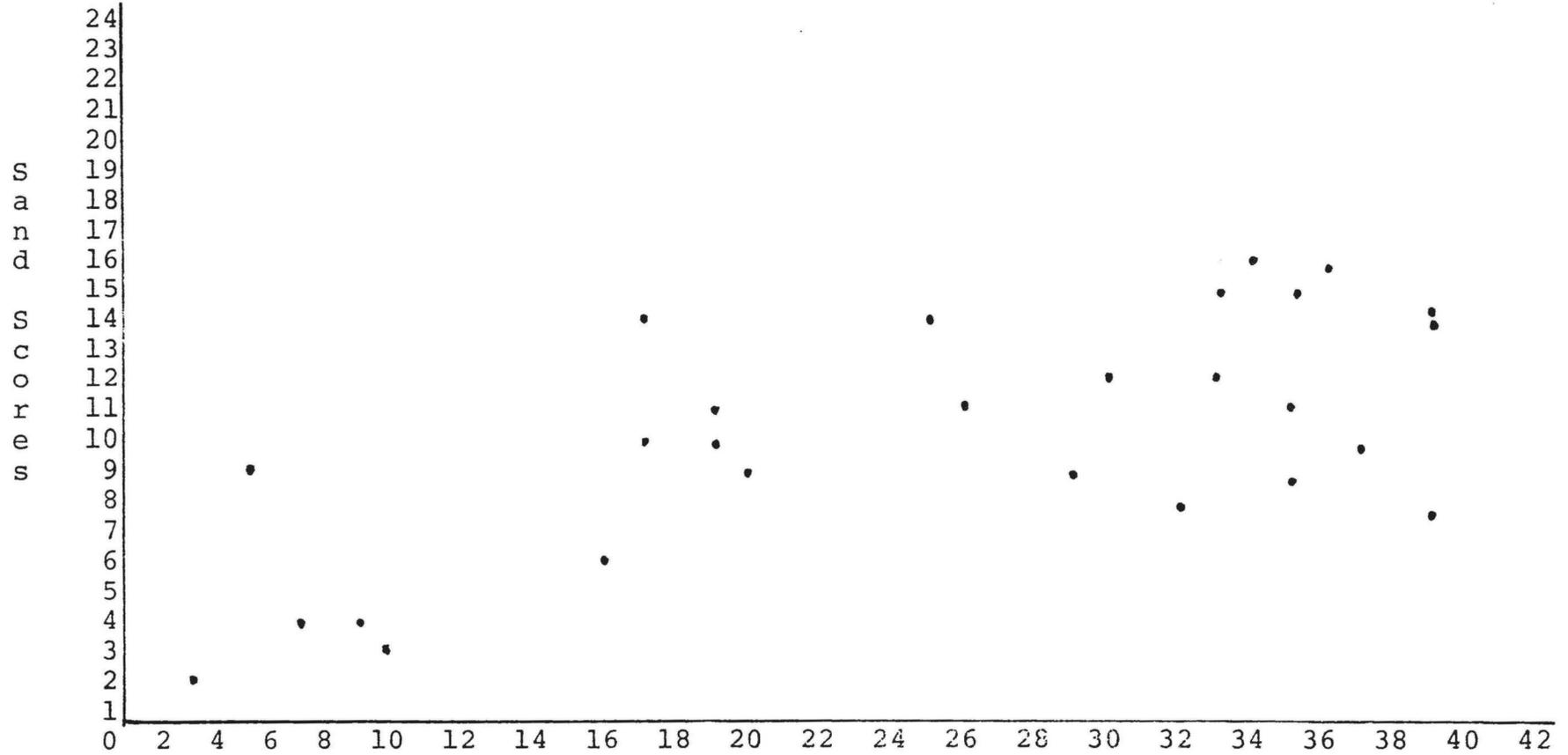
Figure 5
 Scatter Diagram
 ROL/Sand Males



A_2B_1
 $n=29$ $\underline{r}=0.72$ Significant at the .05 level.

Figure 6

Scatter Diagram
ROL/Sand Females



A₂B₂

n=27

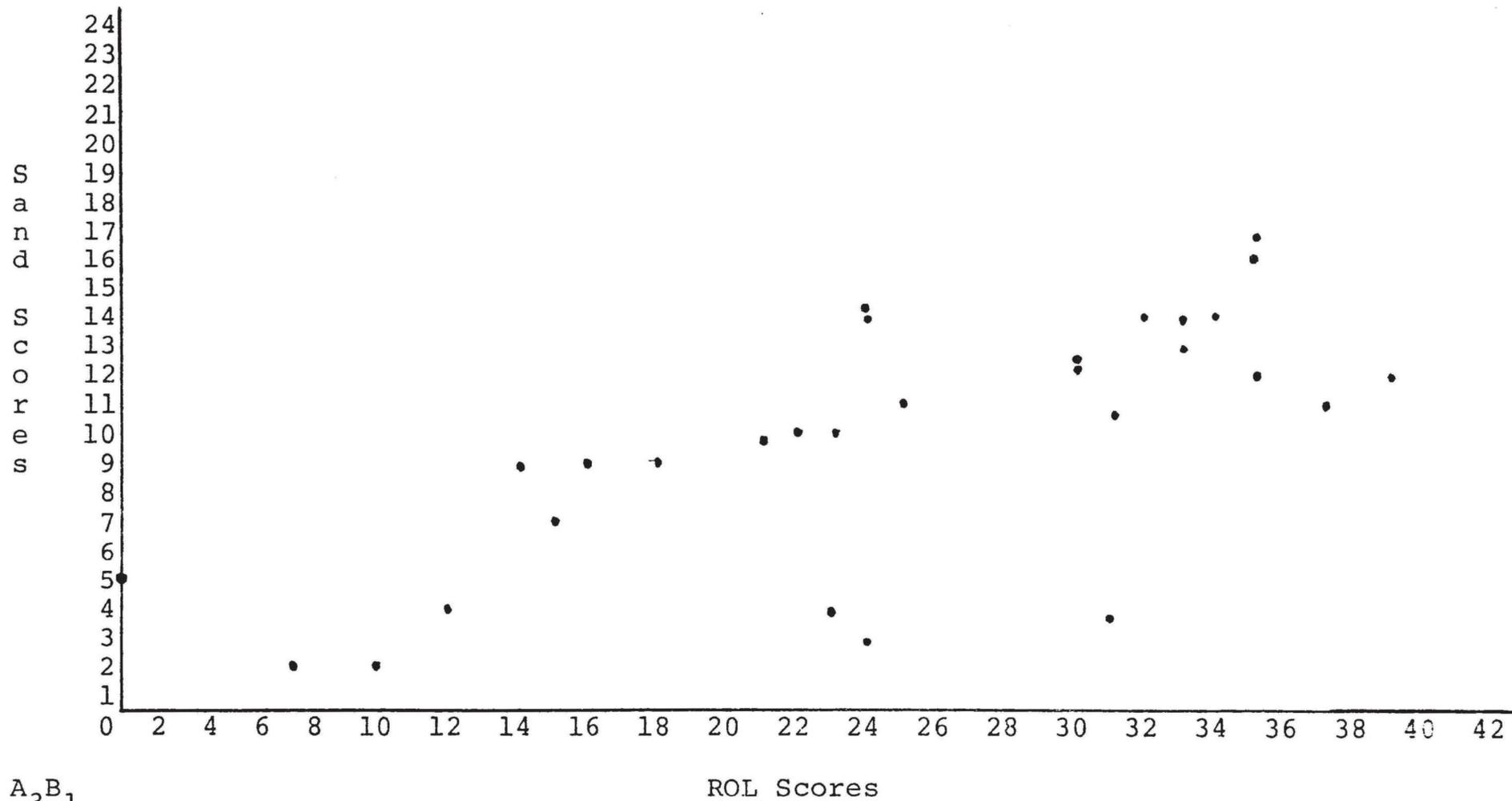
$r=0.68$

Significant at the .05 level.

ROL Scores

Figure 8

Scatter Diagram
ROL/Sand Males



A_3B_1

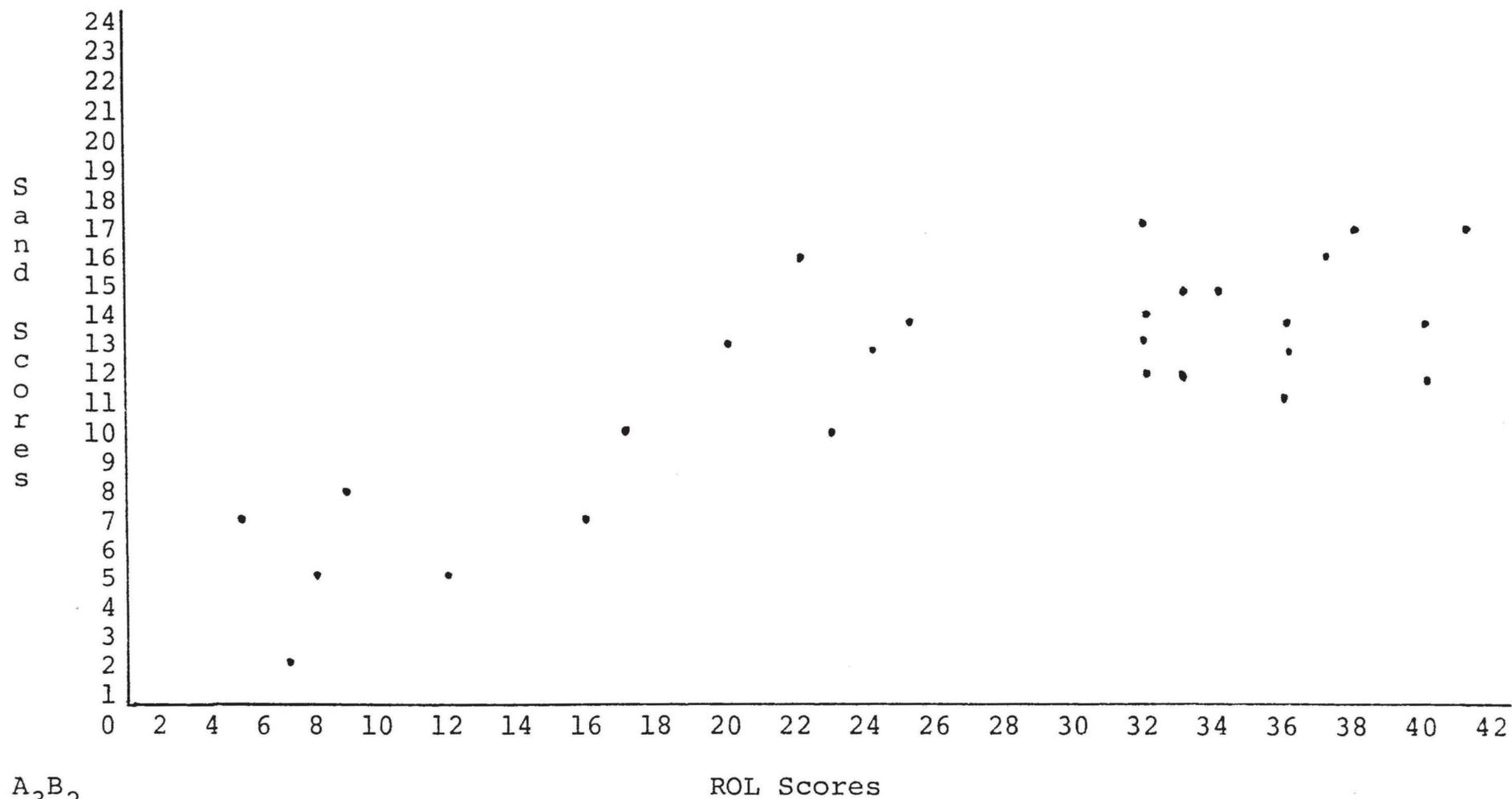
n=29

$r=0.70$

Significant at the .05 level.

Figure 9

Scatter Diagram
ROL/Sand Females



A_3B_2

n=27

$r=0.81$

Significant at the .05 level.

APPENDIX I

Perkins' and Smith's Subject
Identification Numbers and Home
Environment Scores

Perkins' and Smith's Subject
Identification Numbers and Home
Environment Scores

Perkins' Subject Number	Smith's Subject Number	Home Environment Score	Perkins' Subject Number	Smith's Subject Number	Home Environment Score
1	B 1	8.22	30	C 12	3.67
2	B 4	7.57	31	D 2	5.10
3	E 1	7.73	32	C 9	3.99
4	C 5	5.13	33	D 7	4.70
5	C 14	2.47	34	D 5	4.93
6	B 14	6.78	35	C 13	3.38
7	A 2	8.08	36	B 17	6.51
8	E 3	6.33	37	B 3	7.70
9	C 10	3.95	38	D 8	4.68
10	E 5	6.01	39	B 5	7.32
11	B 13	6.85	40	B 7	7.20
12	B 19	6.39	41	B 2	7.71
13	D 4	4.95	42	B 11	6.88
14	B 18	6.45	43	C 1	5.78
15	C 6	4.78	44	B 20	6.39
16	B 8	7.07	45	B 10	6.90
17	C 3	5.33	46	B 21	6.04
18	B 6	7.31	47	C 2	5.33
19	D 1	5.17	48	C 7	4.68
20	A 4	7.67	49	B 15	6.75
21	E 4	6.62	50	A 3	7.74
22	D 3	4.96	51	D 10	4.43
23	B 22	5.93	52	D 9	4.51
24	C 8	4.29	53	A 1	7.00
25	E 6	5.92	54	B 16	6.72
26	B 12	6.88	55	C 11	3.67
27	B 9	7.01	56	D 6	4.72
28	E 2	7.61			
29	C 4	5.31			

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