THE DEVELOPMENT AND VALIDATION OF THE TEST OF COMMUNICATIVENESS

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ABSTRACT

The purpose of this study was to develop and validate the Test of Communicativeness (TOC), a screening device for identifying differences among preschoolers' desire to communicate. Validity was determined by comparing the TOC scores of twenty-seven three-year-old children with: (1) teacher ratings of the child's desire to communicate, and (2) the number of initiative communication attempts made by the child in a day-care setting.

Results provided evidence to support the validity of the TOC. A significant relationship was found to exist among TOC scores, teacher ratings, and the number of initiative communication attempts made by the child.

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Chapter 1

INTRODUCTION

Communication is the process by which man associates with his environment and his fellow human beings. Communication is such a vital part of everything man does, that this process must be intact if he is to exist independently and as a functional member of the society of which he is a part. When a person cannot, for whatever reason, communicate adequately, his disability has ramifications in every aspect of his life.

Speech pathologists have, in the past, been primarily concerned with the form of communication known as language. Emphasis has been placed on determining what receptive and expressive language skills an individual should possess and how his speech should sound. The majority of research has reflected this concern by focusing on language, articulation, voice, and stuttering. Little or no research, however, has been done in the area of communicativeness, or desire to communicate.

There is evidence that some persons seem to lack the desire to communicate, or are non-communicative. Burgoon (1967:62) suggests that there is a global communication construct that may be called "unwillingness-to-communicate," evidenced by persons who have been labelled "anomic or

alienated," "introverted," "having low self-esteem," or "reticent." Blue (1975:32) refers to this type person as the "marginal communicator." But regardless of the different labels and different causes for this predisposition, the general behavioral patterns are the same (Burgoon, 1976:62).

> Think of the child who enters the classroom, grabs a seat in the back, and melts into the background. When questioned or encouraged to take part in oral activities, he grunts negatively or shakes his head to indicate he doesn't know the answer (or doesn't want to say it). If greatly pressured, he may give a minimal response produced with tightly clenched jaws and little, if any, observable lip movement. For the most part he remains silent, slouched in his chair, contributing nothing and acquiring nothing (Blue, 1975:32).

The traditional terms "defective" or "disordered" would not apply to this child (Blue, 1975:33). In fact, he would probably be ignored by the speech pathologist because his problem is not one with which the therapist generally deals. "Reticence does not appear to fit the model presently used in clinics specializing in the treatment of speech disorders (Philips and Metzger, 1973:224)." Philips (1965:23) has hypothesized that "between stuttering, the domain of the speech pathologist, and stagefright, the province of the speech teacher, lies reticence, with which no one works at all." But if, as Burgoon (1976:62) suggests, there is a global construct describing those who do not want to communicate, and if speech pathologists consider communication problems their domain, are they not the logical onew to deal with this problem? Since the "unwillingness-to-communicate" construct offers an explanation and

prediction of actual communication behaviors and outcomes, the measurement of this predisposition would be helpful in identifying those who will have problems communicating (Burgoon, 1976:62).

In the past, when children who lack the desire to communicate have been identified, it was on the basis of such subjective interpretations of their behavior as teacher opinion. Some investigators have attempted to identify these individuals with the use of attitude scales such as Burgoon's "Unwillingness-To-Communicate Scale" (1976). If, however, speech pathologists are going to attempt to intervene with this type of problem, a more objective instrument is needed which measures desire to communicate precisely.

Purpose of the Study

At this time, an objective instrument for measuring degree of communicativeness is unavailable to the speech pathologist. The purpose of this study, therefore, was to develop a screening device which adequately indicates differences among preschoolers' desire to communicate.

Hypotheses

To facilitate the computation and analysis of the data, the hypotheses were stated in the null form.

Major Null Hypothesis

There is no significant relationship among the following measures of communicativeness: Test of

Communicativeness, teacher ratings of the child in terms of his communicativeness, and number of initiative communication attempts made by the child in a free play situation.

Null Subhypotheses

1. There is no significant relationship between Test of Communicativeness scores and teacher ratings of communicativeness for the Total Group of preschool children.

2. There is no significant relationship between Test of Communicativeness scores and number of initiative communication attempts for the Total Group of preschool children.

3. There is no significant relationship between teacher ratings of communicativeness and number of initiative communication attempts for the Total Group of preschool children.

4. There is no significant difference between the performance of boys and that of girls on the Test of Communicativeness.

5. There is no significant difference between boys and girls on teacher ratings of communicativeness.

6. There is no significant difference between boys and girls on the number of their initiative communication attempts.

7. There is no significant relationship between Test of Communicativeness scores and teacher ratings of communicativeness for preschoolers from Day-Care Center A.

8. There is no significant relationship between Test of Communicativeness scores and number of initiative communication attempts for preschoolers from Day-Care Center A.

9. There is no significant relationship between teacher ratings of communicativeness and number of initiative communication attempts for preschoolers from Day-Care Center A.

10. There is no significant relationship between Test of Communicativeness scores and teacher ratings of communicativeness for preschoolers from Day-Care Center B.

11. There is no significant relationship between Test of Communicativeness scores and number of initiative communication attempts for preschoolers from Day-Care Center B.

12. There is no significant relationship between teacher ratings of communicativeness and number of initiative communication attempts for preschoolers from Day-Care Center B.

Limitations of the Study

1. Observation and recording of the number of initiative communication attempts made by each child was done only in a free-play situation at the Day-Care Center, and by only one observer.

2. Observer reliability was checked a month following initial observation by comparing data obtained

from the original and follow-up observations of only one preschool child.

3. Since the Test of Communicativeness is the first objective measure of desire to communicate in preschoolers, and since there is so little known about the concept at this time, the instrument does not claim to yield a complete description of a child's communicativeness. Nor does the test attempt to identify those who are non-communicative enough to require therapeutic intervention.

4. The subject population was limited to 27 preschoolers from 2 Day-Care Facilities in Boone, North Carolina.

5. The conclusions drawn from this study are limited to populations which are similar to the one from which the participants were drawn.

Chapter 2

REVIEW OF RELATED RESEARCH

In order to understand "communicativeness" and the problems which may arise due to the lack of it, one must first have a basic understanding of the communication process itself: what factors influence its normal or abnormal development; which skills are necessary to become a competent communicator; what factors influence the degree to which a child wishes to communicate.

The Basic Process of Communication

Many definitions of communication can be found in the literature, most of which are basically similar to the following one offered by Denes and Pinson (1963:1):

> Communication(s) is any means by which man transmits his experiences, ideas, knowledge, and feelings to his fellow man. Included under this definition are speech, sign language, gesture, writing or any other code which permits messages to be converted or transformed from one set of signs to another e.g., written signs to speech.

Just as there are many definitions of communication, there is also an abundance of communication models. They range from relatively simple graphic depictions such as the one (see Figure 1) offered by Borden (1971:5), to more detailed depictions such as the one (see Figure 2) offered by Irwin and Marge (1972:49), which is based on Osgood's

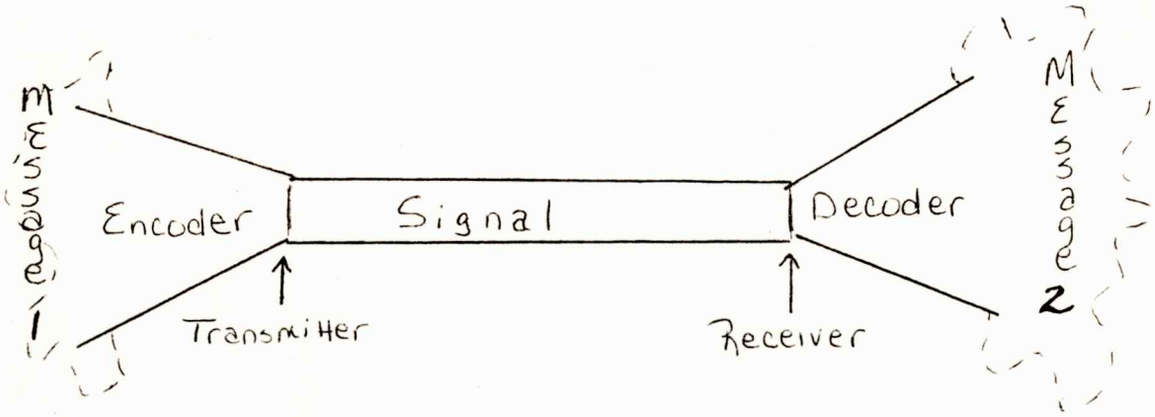

Figure 1

A Simplistic Communication Model

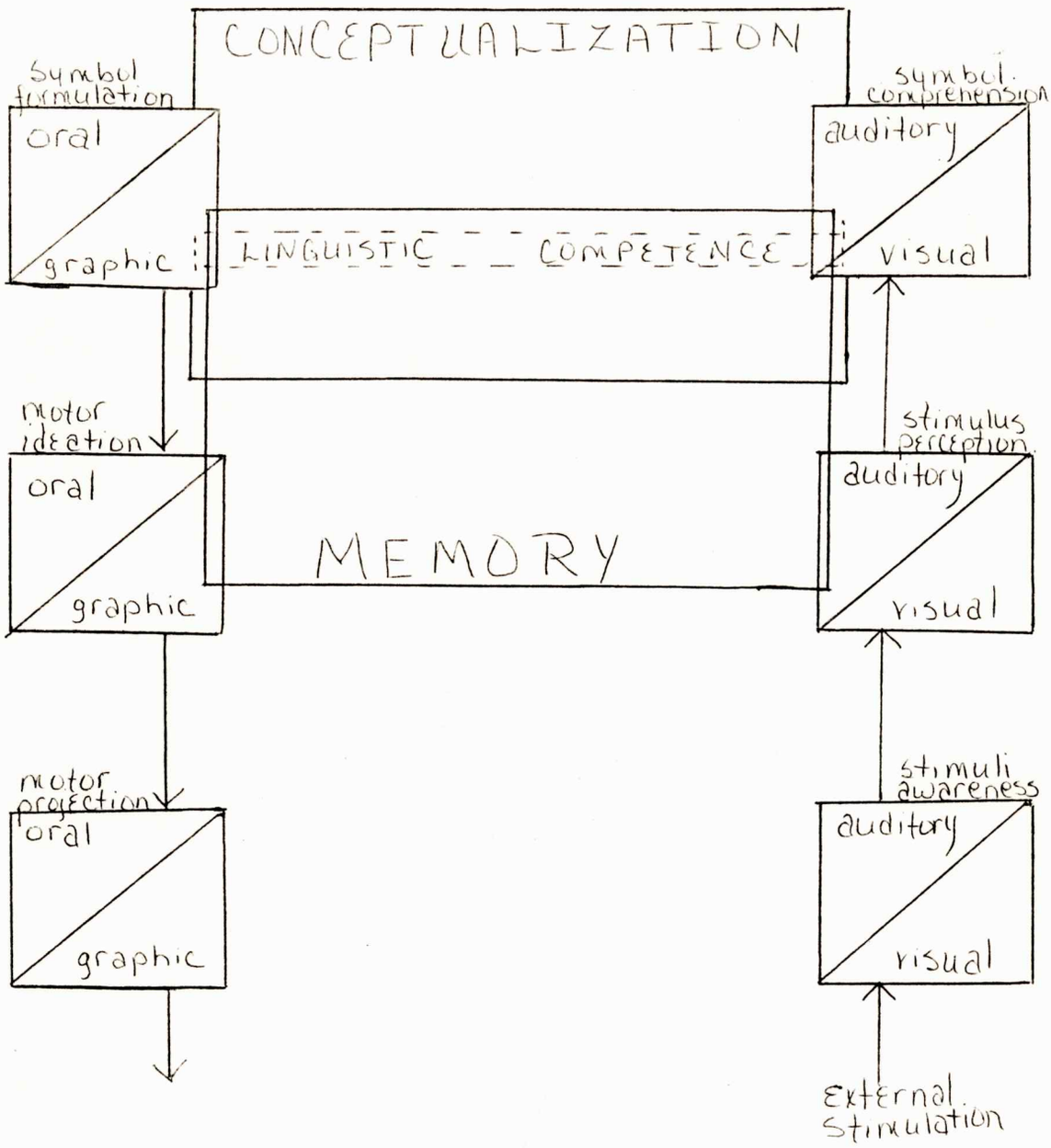

Figure 2

A Complex Communication Model

models (1953). But regardless of the model to which one ascribes, underlying them all is the acceptance of the basic belief that in communication, the sender's job is to select an appropriate set of signals to convey his message; the receiver's job is to understand the message and make an appropriate response.

The Speech Pathologist's View of Communication

Different disciplines view the process of communication in different lights. According to Byrne and Shervanian (1977:1), components of communication which are most important to speech pathologists are: (1) oral formulation and expression; (2) transmission; (3) reception; and (4) interpersonal exchange. In actual clinical practice, however, the speech pathologist focuses more attention on the "how" of communication (as evidenced by an abundance of intervention strategies designed to improve the syntactic, phonologic, and semantic components of language) than with the "why" of communication (Bruner, 1975:1). Little or no therapeutic emphasis is placed on the child's functional use of his communication skills. Speech pathologists concern themselves mainly with the one type of communication known as language, and within language, concern themselves primarily with its content and/or form. Despite the fact that a child acquires not only rules governing pronunciation, word meaning, and grammar, but also acquires rules of usage, there is still a tendency to evaluate his communication

skills in terms of only content and form (Allen and Brown, 1976:55). There is only minimal information regarding measures that are sensitive to functional (use-related) communication in children. Most of the literature suggests using syntactic or semantic structural analysis measures (Allen and Brown, 1976:89). But while these type measures are certainly helpful, they completely ignore the child's use of communication skills.

Communication Competence

In an attempt to focus on the child's functional use of communication, Allen and Brown (1976) stress the need to evaluate not only a child's linguistic competence but also his often ignored "communicative competence." According to these authors, the term "linguistic competence" refers to the possession of the basic linguistic structure rules. "Communicative competence" on the other hand, involves the awareness by the child of transactions which occur between people (Allen and Brown, 1976:248). When a child is communicatively competent, he applies rules governing appropriate language use in a given situation (Allen and Brown, 1976:23). He must be capable of performing a wide range of communication acts required by his social environment; he must take into consideration the relevant characteristics of the communication context (participants, topic, task, setting, preceding events) when choosing the most appropriate communication strategy; he must be willing to carry-out that strategy;

and he must be able to evaluate his communication behavior in terms of its appropriateness (Allen and Brown, 1976:249).

As a result of their literature review, Allen and Brown (1976:273-277) derived and presented in their book a classification of the different types of communication functions (controlling, feeling, informing, ritualizing, and imagining), and within these categories specified certain rules of usage which should be mastered by a certain age. The result of these efforts is perhaps the first attempt at systematically analyzing functional communication.

Communication competency scales such as the one mentioned above tell us what a child should and should not be able to do, in terms of usage, at a certain developmental age. But there is a group of people whose communication usage problems have generally been ignored even by those attempting to deal with pragmatics of communication. The people within this group may know how to use verbal communication, but they lack the desire, the motivation to communicate. They have learned, at some point during their lives, to shun social interaction.

In order to determine what happens during communication development that might cause this lack of desire, the developmental process must be examined more closely.

Communication Development

Allen and Brown (1976:66) assert that when considering the development of communication and communicative competency,

two facts become readily apparent: (1) communication development is stage-related, and (2) culture and the communicative context influence the child's communication strategies.

Stage-Related Aspects of Development

Piaget (1952) has formulated a taxonomy of developmental periods beginning with the sensori-motor stage (0-2 years), and continuing through the preoperational stage (2-7 years), the concrete stage (7-11 years), and finally the formal operations stage (11-15 years). During these stages, the child develops increasingly more complex schemes which he uses to organize and communicate with his environment (Piaget, 1952).

If one accepts Piaget's propositions, then, it would be relatively easy to view development of communicative behavior as being structly stage-related. However, the process is not quite so simplistic. Communication contexts, as well, influence the child's strategies and development.

Cultural Influences

There seems to be a tendency for children from different cultural backgrounds to respond differently in certain communication situations (Williams and Naremore, 1969). Studies by Boggs (1972) involving Hawaiian children, Ward (1971) involving southern black children, and Philips (1972) involving American Indian children, all provide evidence suggesting that these cultural groups perform

differently than do other cultural groups in similar situations. In a study by Williams and Naremore (1969), results suggested that lower-class children give minimal responses to questions, while middle-class children take greater advantage of opportunity to speak, go into more detail, and elaborate more.

Besides these broad cultural influences, there are perhaps more subtle and more important influences on communicative behavior which occur within the child's immediate environment.

Immediate Environmental Influences

According to Allen and Brown (1976:17) much communication shaping occurs within the family. In fact, a child can only acquire the language that is overheard in his home or environment (Allen and Brown, 1976:154). Through communicating with significant others in his environment, the child learns whether social interaction is basically a positive or negative experience. He also learns from his environment how to employ his language to communicate most effectively in various situations (Allen and Brown, 1976:154).

If a child is surrounded by people who encourage communication, and support his attempts at it, he will prabably learn that communication is a positive, rewarding experience. This child, by the time he reaches adulthood will have developed an adequate desire to communicate.

Development of Non-Communicativeness or Reticence

The talkative, questioning, or inquisitive child is treated as a noisy, bothersome one in some home and school environments (Allen and Brown, 1976:19). Instead of encouraging communication attempts, parents and teachers believing that children "should be seen and not heard" discourage or punish communicative behavior. The child who has been exposed to this type of reaction from significant others in his environment will soon learn to quit talking. "Inappropriate behavior patterns (speaking, talking too much) that induce anxiety in parents or significant others become associated in the child with anxiety or other forms of punishment, and are avoided (Allen and Brown, 1976:40)."

"The problem of communication rejection is widespread and generally involves kids who have met with repeated failure during early opportunities for communication inside or outside the home (Blue, 1975:33)." For some of these children speaking is just no fun, so they avoid it whenever they can. "The probable effect of suppression of a child's communication leads to mistrust, lack of initiative, guilt, and poor self-image, and since the early parent-child relationship shapes the future adult, the child is likely to show the results of these experiences throughout his life (Griffin and Patton, 1971:62)." Indeed, it seems quite probable that "the foundation of maturity development and the basis for a positive self-concept are undermined when

a child's communication meets suppression (Griffin and Patton, 1971:62)."

The child who avoids social, verbal interaction, is unwilling to communicate unless prodded, is disposed to be silent, and is not inclined to speak freely can be termed, according to Philips and Metzger (1973:220), as "reticent."

Characteristics of the Reticent Individual

Philips (1968:40) states that the reticent individual is so very distressed about his inability (or lack of desire) to speak that the problem affects his entire personality. More specific behavioral characteristics of the reticent individual include: shakiness which interferes with attempts to communicate during classroom recitations and public performances; unpleasant physical symptoms such as nausea, headaches, excessive perspiration, and inability to see the audience during verbal attempts; occasional fears and apprehension requiring interruption of communication efforts; inability to communicate with "important" people; hesitance, vocalized pauses, differences in voice, syntactic awkwardness in speech (but not conforming to common categories of speech pathologies); a compulsion to be unnaturally apologetic when ideas are challenged; preference for written communication; and inability to talk with others (Philips, 1968:41-42). Griffin and Patton (1971:62) state that the reticent individual also commonly "lacks the trusting and initiating tendencies related to confidence

in a speech situation, . . . frequently fears audience reactions . . . and is unwilling to assert himself through leadership activities." All of these traits are characteristic of a lack of initiative development (Griffin and Patton, 1971:62).

Other Causes of Reticence

Besides suppression of communication by significant others in the child's environment, Philips (1968:47) suggests that the following may also cause reticence:

> Developmentally, reticence may be construed as perseveration of an immature style of communication possibly retained as a defense in a newly adopted situation. Another cause is parental emulation. In homes where kids observe hostility of parents toward each other and the children, it may not be possible to learn that there are social rewards to be reaped from communication effectiveness.

Solutions

A person's repeated failure to participate in communication is a problem which demands direct attention. Blue (1975:36) states that to wait until a reticent child feels like talking or until he "grows out of it" is unwise, for the result of such passivity is too often, a young adult with reduced skills who fails to communicate satisfactorily with his employer and fellow workers.

As if stands now, however, reticence, or the lack of desire to communicate, does not fit the model presently used in speech clinics (Philips and Metzger, 1973:224). "It seems that limitations of specialization seem to have

precluded reticence from becoming a major concern for speech pathologists (Philips and Metzger, 1973:224)."

The speech pathologist must address himself to the problem of identifying and treating the individual who lacks the desire to communicate, as early in his life as possible. The logical first step toward reaching this goal is to construct an instrument which will objectively measure quantitative differences in desire to communicate. It was for this reason that the Test of Communicativeness was designed and this study was conducted.

Chapter 3

PROCEDURE

In this chapter, the participants of the study are identified, the methodology is discussed, the instruments and data-collecting devices used in the study are described, and the statistical techniques employed to treat the data are explained.

Participants in the Study

The subjects were children, ages 3.0 to 3.11, selected from two preschool day-care facilities in Boone, North Carolina. The total number of children involved was twenty-seven.

Methodology

The purpose of this study was to develop and validate the Test of Communicativeness (TOC). Since there are no equivalent tests with which to compare scores on the TOC, validity was determined by comparing TOC scores with: (1) teacher ratings of the child's desire to communicate, and (2) the number of initiative communication attempts made by the child in a day-care setting.

Teacher ratings of communicative behavior was considered a valid indicator of actual communicativeness since teachers' ability to make accurate judgments regarding the

behavior of their students has received some support in the research literature (Ullmann, 1952; Nelson, 1971; Keogh and Windeguth-Behn, 1974).

Determining the number of initiative communication attempts made by a child in his classroom is an example of a direct observation procedure, which is a commonly used and widely accepted tool of descriptive research. Carefully focused, thoroughly recorded, systematic observation is considered a valid means of obtaining information concerning how a child actually behaves in his environment (Best, 1977: 178).

The communicativeness of each child, then, was necessarily measured in the following three ways.

Observation

Each child was individually observed for three consecutive minutes, for three consecutive days, while participating in a free-play situation at his day-care center.

A hand-counter was used by the observer to tally the number of initiative, or noncontingent, verbal or gestural communication attempts directed by the child toward another person within the three-minute time period (see Appendix D for the number of initiative communication attempts made by each subject). The total number of communicative attempts initiated by each child was recorded every day on a data sheet (see Appendix A).

At the end of three days, the children were ranked from "most communicative" to "least communicative" on the basis of their average number of initiated communicative attempts made over the three-day observation period (see Tables 2, 3, and 4). When two or more children received the same average number of initiative communication attempts, the children received the same rank score.

In an effort to check observer reliability, the three-day observation sequence mentioned above was repeated a month later with one randomly selected preschooler. The average number of initiative communication attempts recorded during each of these two observation sequences were then compared.

Data revealed a difference of only one between the number of initiative communication attempts during original and follow-up sequences. This evidence, although admittedly minimal, does provide some support for the claim of observer reliability.

Teacher Ratings of Communicativeness

Each child was assigned by two of his teachers, a scale value from 1-9 with 1 indicating "does not like to communicate at all," and 9 indicating "loves to communicate" (see Appendix B for teacher rating forms).

A mean scale value for each child was obtained by averaging the scores given him by both teachers (see Appendix D for actual scale values given each subject).

The mean scale values were then converted to rank scores for the purpose of statistical treatment (see Tables 2,3, and 4). When two or more children received the same mean scale score, the children were given identical rank scores.

Administration of the Test of Communicativeness

Administration of the Test of Communicativeness was begun on the fourth day, following the three-day observation period during which time the children had a chance to adjust to a stranger in their environment.

The children were tested individually in an area which was as secluded from the rest of the classroom as possible, in an effort to reduce distractability and to prevent the other children from viewing the testing procedure (see Appendix D for raw TOC scores).

Each child's test score was converted to a rank score for the purpose of statistical treatment (see Tables 2,3, and 4). When two or more children received the same score on the TOC, the children were given identical rank scores.

Test Instrument

The test which was developed for use in this study was the Test of Communicativeness or TOC (see Appendix C), which is composed of fifteen items, each of which generally attempt to involve the child in a frustrating or incomplete situation, which cannot be resolved or completed

unless the child initiates communication with the examiner. For instance, one item requires the child to draw a picture of his mother. The child has no drawing implement, however. To resolve the task, therefore, he must communicate the fact that he needs something with which to draw.

All items were originally constructed for use in this test except for numbers 1, 4, 6, and 9 which were taken from Spradlin (1963) and number 15 which was taken from McLean and Snyder-McLean (1978).

The child's communicative attempts or responses to each test item are scored by the examiner as either:

0	1	2	3	4
No Response	Prompted Response	Minimal Spontaneous Response	Adequate Spontaneous Response	Elaborate Spontaneous Response

The scores on each of the items were added together and divided by 15 to obtain the Test of Communicativeness Mean Scaled Score, which is the score that was used in ranking the children.

The reliability coefficient for this instrument was based on a split-half procedure, comparing scores obtained on odd numbered items with scores obtained on even numbered test items. A coefficient of .72, which was significant at the .001 level, was obtained. This data suggest acceptable reliability between the odd and even numbered test items.

Statistical Treatment

For the purpose of treating and analyzing the data obtained from the study, the Spearman Rank-Order Correlation and the t-Test for determining the difference between two independent means were employed. The .05 level of significance was used as criteria for determining the significance of data.

Correlations between the following were determined: (a) Test of Communicativeness scores and teacher rating scores, for Total Group, for Day-Care Center A, for Day-Care Center B; (b) Test of Communicativeness scores and number of initiative communication attempts, for Total Group, for Day-Care Center A, for Day-Care Center B; (c) teacher rating scores and number of initiative communication attempts, for Total Group, for Day-Care Center A, for Day-Care Center B.

To determine the difference between boys and girls on the Test of Communicativeness, teacher rating scores, and number of initiative communication attempts, t-ratios were computed.

Summary

Twenty-seven three-year-old subjects were (1) observed for the purpose of counting the number of times they initiated communication, (2) rated by two of their teachers on the basis of how much the child "likes to communicate," and (3) administered the Test of Communicativeness.

The children were then ranked from "most communicative" to "least communicative" as determined by each of the above measures of communicativeness.

The Spearman Rank-Order Correlation was employed to determine the degree to which these measures mutually relate. The t-Test for determining the difference between two independent means was employed to examine the difference between boys and girls on the three measures.

Chapter 4

ANALYSIS OF THE DATA

In chapter 4, data obtained from this study are analyzed and presented in tabular form, and findings are summarized.

The null hypothesis was used for the purpose of facilitating the computation and analysis of data:

There is no significant relationship among the following measures of communicativeness: Test of Communicativeness, teacher ratings of the child in terms of his communicativeness, and number of initiative communication attempts made by the child in a free-play situation.

Tabular Organization

Information relative to the number of subjects within each subgroup and each subject's rank on the TOC, teacher ratings, and number of initiative communication attempts is presented in Tables 1-4.

Tables 5-7 contain information concerning the pairing of the measures, the correlation coefficients, and levels of significance for the computed correlations among the three measures of communicativeness.

Table 8 contains the t-ratios and levels of significance for the computed t-ratios between boys and girls on each of the three measures of communicativeness.

Table 1

Frequencies of Subgroups

Subgroup	Frequency
Day-Care Center A	9
Day-Care Center B	18
Total Group	27

Table 2

Rankings of the Total Group of Subjects on the Three Measures of Communicativeness

S	Sex	Preschool	TOC	Teacher Ratings	Initiative Communication Attempts
A	F	A	7.5	5.0	10.0
B	M	A	19.5	9.5	12.0
C	M	A	9.5	7.0	6.0
D	F	A	6.0	7.0	10.0
E	M	A	25.5	22.5	13.5
F	M	A	1.5	15.5	1.0
G	F	A	7.5	7.0	13.5
H	M	A	22.0	19.0	25.5
I	F	A	23.0	12.0	18.5
J	M	B	19.5	2.5	10.0
K	M	B	19.5	15.5	24.0
L	F	B	19.5	26.5	18.5
M	M	B	5.0	12.0	8.0
N	F	B	1.5	2.5	21.5
O	M	B	9.5	9.5	6.0
P	F	B	11.5	12.0	6.0
Q	F	B	14.5	15.5	23.0
R	M	B	27.0	26.5	25.5
S	M	B	14.5	22.5	18.5
T	F	B	14.5	25.0	21.5
U	M	B	14.5	22.5	4.0
V	M	B	3.5	2.5	2.0
W	M	B	3.5	19.0	3.0
X	M	B	24.0	19.0	18.5
Y	F	B	25.5	22.5	27.0
Z	F	B	17.0	15.5	15.5
AA	M	B	11.5	2.5	15.5

Table 3

Rankings of Day-Care Center A Subjects on the Three Measures of Communicativeness

S	Sex	TOC	Teacher Rating	Initiative Communication Attempts
A	F	3.5	1.0	3.5
B	M	6.0	5.0	5.0
C	M	5.0	3.0	2.0
D	F	2.0	3.0	3.5
E	M	9.0	9.0	6.5
F	M	1.0	7.0	1.0
G	F	3.5	3.0	6.5
H	M	7.0	8.0	9.0
I	F	8.0	6.0	8.0

Table 4

Rankings of Day-Care Center B Subjects on the Three Measures of Communicativeness

S	Sex	TOC	Teacher Rating	Initiative Communication Attempts
J	M	14.0	2.5	7.0
K	M	14.0	9.0	16.0
L	F	14.0	17.5	11.0
M	M	4.0	6.5	6.0
N	F	1.0	2.5	13.5
O	M	5.0	5.0	4.5
P	F	6.5	6.5	4.5
Q	F	9.5	9.0	15.0
R	M	18.0	17.5	17.0
S	M	9.5	14.0	11.0
T	F	9.5	16.0	13.5
U	M	9.5	14.0	3.0
V	M	2.5	2.5	1.0
W	M	2.5	11.5	2.0
X	M	16.0	11.5	11.0
Y	F	17.0	14.0	18.0
Z	F	12.0	9.0	8.5
AA	M	6.5	2.5	8.5

Results of Correlations

The results of the computed correlations are discussed under the restatement of each null subhypothesis.

Null Subhypothesis 1

> There is no significant relationship between Test of Communicativeness scores and teacher ratings of communicativeness for the Total Group of preschool children.

According to the information in Table 5, null subhypothesis 1 was rejected at the .01 level of significance.

Data indicated that, among the Total Group of preschoolers, there was a significant level of agreement between TOC scores and teacher rating scores.

Null Subhypothesis 2

> There is no significant relationship between Test of Communicativeness scores and number of initiative communication attempts for the Total Group of preschool children.

According to information contained in Table 5, null subhypothesis 2 was rejected at the .01 level of significance.

Data indicated that, among the Total Group of preschoolers, there was a significant level of agreement between TOC scores and the number of initiative communication attempts.

Null Subhypothesis 3

> There is no significant relationship between teacher ratings of communicativeness and number of initiative communication attempts for the Total Group of preschool children.

Table 5

Correlation Coefficients (rho) among the TOC, Teacher Ratings, and Number of Initiative Communication Attempts for the Total Group

Pairing of Measures	Correlation Coefficient	Level of Significance
TOC-Teacher Rating	.56	.01
TOC-Initiative Communication Attempts	.64	.01
Teacher Rating-Initiative Communication Attempts	.40	.05

According to the information found in Table 5, null subhypothesis 3 was rejected at the .05 level of significance.

Data indicated that, among the Total Group of preschoolers, there was a significant level of agreement between teacher rating scores and the number of initiative communication attempts.

Null Subhypothesis 7

> There is no significant relationship between Test of Communicativeness scores and teacher ratings of communicativeness for preschoolers from Day-Care Center A.

According to information contained in Table 6, null subhypothesis 7 was not rejected.

Data indicated that, among preschoolers from Day-Care Center A, there was no significant relationship between TOC scores and teacher rating scores.

Null Subhypothesis 8

> There is no significant relationship between Test of Communicativeness scores and number of initiative communication attempts for preschoolers from Day-Care Center A.

According to the information found in Table 6, null subhypothesis 8 was rejected at the .05 level of significance.

Data indicated that, among preschoolers from Day-Care Center A, there was a significant level of agreement between TOC scores and number of initiative communication attempts.

Table 6

Correlation Coefficients (rho) among the TOC, Teacher Ratings, and Number of Initiative Communication Attempts for Day-Care Center A

Pairing of Measures	Correlation Coefficient	Level of Significance
TOC-Teacher Rating	.56	NS
TOC-Initiative Communication Attempts	.74	.05
Teacher Rating-Initiative Communication Attempts	.44	NS

Null Subhypothesis 9

> There is no significant relationship between teacher ratings of communicativeness and number of initiative communication attempts for preschoolers from Day-Care Center A.

According to information in Table 6, null subhypothesis 9 was not rejected.

Data indicated that, among preschoolers from Day-Care Center A, there was no significant relationship between teacher rating scores and the number of initiative communication attempts.

Null Subhypothesis 10

> There is no significant relationship between Test of Communicativeness scores and teacher ratings of communicativeness for preschoolers from Day-Care Center B.

According to information contained in Table 7, null subhypothesis 10 was rejected at the .01 level of significance.

Data indicated that, among preschoolers from Day-Care Center B, there was a significant level of agreement between TOC scores and teacher rating scores.

Null Subhypothesis 11

> There is no significant relationship between Test of Communicativeness scores and number of initiative communication attempts for preschoolers from Day-Care Center B.

According to information found in Table 7, null subhypothesis 11 was rejected at the .01 level of significance.

Data indicated that, among preschoolers from Day-Care Center B, there was a significant level of agreement between TOC scores and the number of initiative communication attempts.

Table 7

Correlation Coefficients (rho) among the TOC, Teacher Ratings, and Number of Initiative Communication Attempts for Day-Care Center B

Pairing of Measures	Correlation Coefficient	Level of Significance
TOC-Teacher Rating	.59	.01
TOC-Initiative Communication Attempts	.64	.01
Teacher Rating-Initiative Communication Attempts	.43	.05

Null Subhypothesis 12

There is no significant relationship between teacher ratings of communicativeness and number of initiative communication attempts for preschoolers from Day-Care Center B.

According to information contained in Table 7, null subhypothesis 12 was rejected at the .05 level of significance.

Data indicated that, among preschoolers from Day-Care Center B, there was a significant level of agreement between teacher rating scores and the number of initiative communication attempts.

Results of t-Tests

The results of the computed t-ratios are discussed under restatement of each null subhypothesis.

Null Subhypothesis 4

There is no significant difference between the performance of boys and that of girls on the Test of Communicativeness.

According to information contained in Table 8, null subhypothesis 4 was not rejected.

Data indicated that there was no significant difference between the performance of boys and girls on the TOC.

Null Subhypothesis 5

There is no significant difference between boys and girls on teacher ratings of communicativeness.

According to the information found in Table 8, null subhypothesis 5 was not rejected.

Table 8

t-Ratios Computed from Boys' and Girls' Mean Scores on the TOC, Teacher Ratings, and Number of Initiative Communication Attempts

Measure	t-Ratio	Level of Significance
Test of Communicativeness	.37	NS
Teacher Rating	.06	NS
Initiative Communication Attempts	1.70	NS

Data indicated that there was no significant difference between the way teachers rated boys and girls in terms of their communicativeness.

Null Subhypothesis 6

> There is no significant difference between boys and girls on the number of their initiative communication attempts.

According to the information contained in Table 8, null subhypothesis 6 was not rejected.

Data indicated that there was no significant difference between the number of communication attempts made by boys, and the number made by girls.

Summary

Based upon statistical analysis of the data obtained from this study, there was a significant relationship between TOC scores and teacher rating scores for the Total Group and for Day-Care Center B.

There was a significant relationship between TOC scores and number of initiative communication attempts for the Total Group, for Day-Care Center A, and for Day-Care Center B.

A significant relationship was found between teacher rating scores and number of initiative communication attempts for the Total Group and for Day-Care Center B.

The highest degree of relationship was found to exist between TOC scores and teacher rating scores for the Total

Group and Day-Care Center B, and between TOC scores and the number of initiative communication attempts for the Total Group and for Day-Care Center B.

No significant difference was found between boys and girls on the TOC, teacher ratings, or number of initiative communication attempts.

Chapter 5

SUMMARY, DISCUSSION, AND RECOMMENDATIONS FOR FURTHER RESEARCH

Chapter 5 includes a summary of the study, a discussion of the conclusions and implications drawn from the data, and recommendations for further research.

Summary

The purpose of this study was to develop and validate the Test of Communicativeness (TOC), a screening device for identifying differences among preschoolers' desire to communicate. Validity was determined by comparing TOC scores with: (1) teacher ratings of the child's desire to communicate, and (2) the number of initiative communication attempts made by the child in a day-care setting.

All twenty-seven subjects, from two different preschool day-care centers were observed, were rated by their teachers, and were administered the TOC.

The null hypothesis was used for the purpose of facilitating the computation and analysis of the data:

There is no significant relationship among the following measures of communicativeness: Test of Communicativeness, teacher ratings of the child in terms of his communicativeness, and number of initiative communication attempts made by the child in a free-play situation.

The following findings were based upon statistical analysis of the data obtained during the investigation:

1. There was a significant relationship between TOC scores and teacher rating scores for the Total Group and for Day-Care Center B.

2. There was a significant relationship between TOC scores and number of initiative communication attempts for the Total Group, for Day-Care Center A, and for Day-Care Center B.

3. There was a significant relationship between teacher rating scores and number of initiative communication attempts for the Total Group and for Day-Care Center B.

4. The highest degree of relationship was found to exist between TOC scores and teacher rating scores for the Total Group and Day-Care Center B, and between TOC scores and the number of initiative communication attempts for the Total Group and for Day-Care Center B.

5. There was no significant difference between boys and girls on the TOC, teacher ratings, or number of initiative communication attempts.

Discussion

Results of the present study provide evidence to support the validity of the Test of Communicativeness as a tool for identifying differences among preschoolers' desire to communicate. A significant relationship was found to exist between the TOC and two other measures of communi-

cativeness: teacher ratings and the number of initiative communication attempts made by the child.

Correlation coefficients computed among the three measures of communicativeness were approximately the same for all three subgroups of subjects. The coefficients, however, were deemed significant for the Total Group and Day-Care Center B, while non-significant (in two cases) for Day-Care Center A. This occurrence was conceivably due to the small sample size of Day-Care Center A. Containing only nine subjects, this subgroup was only one-half the size of Day-Care Center B, and only one-third the size of the Total Group. It is possible that the small sample size of Day-Care Center A was the factor responsible for the non-significance of the coefficients.

Another finding of interest was that lower correlation coefficients were found between measures of communicativeness when teacher ratings were involved. Even when the correlation coefficients obtained between teacher ratings and another measure were significant, they were considerably lower than the coefficients obtained when teacher ratings were not involved.

Perhaps the most important implication of the study is that differences among individuals' communicativeness can be objectively identified, with a considerable degree of validity and reliability. Considering, however, that the TOC is the first objective measure of desire to communicate, and since there is so little known about the concept at

this time, the present instrument does not yield a complete description of a child's communicative behavior. In fact, the test does not even attempt to identify those who are non-communicative enough to require therapeutic intervention. The instrument is of value, however, in that it has provided researchers with an initial stepping-stone, a place to begin in the area of children's communicativeness.

Recommendations for Further Research

The following suggestions are made as the result of the present study:

1. The teacher-rating variable should be explored further to ascertain its effectiveness as a measure of communicativeness. The training of teacher-raters prior to a study such as this should be considered as a means of increasing the reliability and validity of the teacher's response.

2. In an effort to control observer reliability, three (as opposed to only one) observers should be involved in observing and recording the number of initiative communication attempts.

3. In spite of the fact that the TOC proved to be a valid, reliable measure, an item analysis should be performed to eliminate items which are least effective, and thereby further increase the reliability and validity of the test instrument.

4. Normative data for the TOC should be gathered so that the instrument may be used more effectively to identify those preschoolers who are non-communicative enough to require therapeutic intervention.

5. Differences in performance on the TOC among children of high, middle, and low socio-economic status should be studied.

APPENDICES

APPENDIX A. Data Sheets for Recording Observations

Observed Communicativeness

Name of Day-Care Facility_____

Teacher_____Observer_____

Subject	# of Initiative Communication Attempts			
	Day 1	Day 2	Day 3	Day 4

APPENDIX B. Teacher Rating Forms

Instructions for Raters

Name of Day-Care Facility_____

Date_____Rater_____

The children in your classroom have been given the Test of Communicativeness, which measures the child's desire to communicate. One of the ways in which this test will be evaluated is by comparing the score obtained from it with the way you, who are well acquainted with the children rate them on the basis of how much they enjoy communicating. For this reason, it is necessary to enlist your help in evaluating the children.

Please examine the attached sheet which lists the names of your pupils who are to be rated. Rate these children on a scale of 1-9 with 1 indicating "does not like to communicate at all," and 9 indicating "loves to communicate." Rate only the children whose names are listed on the attached sheet.

REMINDER: Do not make your judgment on the basis of how well the child talks, but rather on the basis of how much the child likes to communicate.

Thank-you very much.

Pupils to be Rated	(Circle the appropriate number for each child.)
(Student's Name)	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9
_____	1....2....3....4....5....6....7....8....9

APPENDIX C. The Test of Communicativeness

TEST OF COMMUNICATIVENESS
(Examiner's Form)

Directions for Administration

(1) Read the instructions for administering each test item, and proceed accordingly.

(2) There is no specific verbal or gestural response to be elicited for each item. All verbal and gestural communicative attempts pertaining to the stimulus item should be considered in the scoring.

(3) On all items, there is a time limit during which the child is required to respond. If, at the end of this time period, the child has not responded, a prompt may be given.

(4) A prompt may be defined as any additional information or encouragement given to the child in an effort to elicit a response from him.

(5) Any response emitted by the child after the prompt is given should be scored "2" (see score sheet), no matter how elaborate the response.

Directions for Scoring

(1) The response for each test item is scored on a scale ranging from 0 to 4 (see score sheet).

(2) The Test of Communicativeness Score may be obtained by adding together the individual scores and dividing by 15.

Materials	Instructions
1. wind-up toy	a. Examiner holds wind-up toy in the child's view. b. Examiner winds up toy, places it on the table out of the child's reach and allows it to run for five seconds. c. Examiner picks up toy and silently holds it in the child's view for 10 seconds. d. If the child has not responded, a prompt is given. e. If the child still fails to respond, the toy is placed back into the box.

TOC (cont.)

	Materials	Instructions
2.	ball	a. Examiner holds the ball within the child's view. b. Examiner says I LIKE TO PLAY BALL, and rolls the ball across the table to the child. c. If the child has not indicated that he wants to play ball with the examiner after 15 seconds, a prompt is given. d. If the child still fails to respond, the ball is placed back in the box.
3.	simple puzzle	a. Examiner shows the child a puzzle which has been put together. b. Examiner takes the pieces out and subtly keeps one of the pieces in her hand. c. Examiner says YOU PUT IT BACK TOGETHER. d. After completion of the puzzle, the child has 15 seconds to indicate that a piece of the puzzle is missing. If he has not responded within this time, a prompt is given. e. If the child still fails to respond, the incomplete puzzle and missing piece are put back in the box.
4.	piece of paper crayon	a. Examiner makes sure the child has no drawing implement. b. Examiner then gives the child a piece of paper and says DRAW A PICTURE OF YOUR MOMMY FOR ME. c. The child has 15 seconds in which to indicate that he needs a crayon. If he has not responded, a prompt is given. d. If he still fails to respond, he is given a crayon and allowed to draw, but is given a "0" for this item.
5.	form board & forms 1 form which does not fit	a. Examiner shows the child an empty form board. She also demonstrates placing a form in its proper space on the board.

TOC (cont.)

Materials	Instructions
	b. Examiner gives the child the remaining forms, as well as the 1 form which will not fit, and says NOW YOU PUT THESE ON THE BOARD. c. If, 15 seconds after filling up the board, the child has not indicated that there is an extra form, a prompt is given. d. If the child still fails to respond, the completed form board and extra piece are placed back in the box.
6. M&M's	a. Examiner holds out her two open palms (one of which contains an M&M) in front of the child. b. Examiner places both hands behind her back and says IF YOU GUESS WHICH HAND THE M&M IS IN, YOU CAN EAT IT. c. Examiner holds out her two closed fists in front of the child so he can guess. d. If the child guesses, the examiner puts her hands in her lap and waits for 30 seconds for the child to indicate that he wands feedback on the right-ness or wrongness of his guess. If he fails to respond within this time, a prompt is given. e. If he still fails to respond, he is told whether he was right or wrong, but is given a score of "0" for the item.
7. 12 blocks	a. Examiner builds a tower with the 12 blocks. b. Examiner tears down her tower and says NOW YOU DO IT, but hands the child only 1 block. c. The child has 10 seconds to indicate that he does not have enough blocks. If he has not responded within this time, a prompt is given. d. If he still fails to respond, all 12 blocks are placed in the box.

TOC (cont.)

Materials	Instructions
8. box with lid filled with pretty seashells (or anything of interest to the child)	a. Examiner places the closed box in the child's view but out of the child's reach. b. Examiner peeks into the box and for 15 seconds makes such comments as YOU SHOULD SEE WHAT I HAVE IN HERE or I HAVE SOMETHING REAL SPECIAL IN HERE. c. Then for 15 seconds the examiner silently looks into the box, giving the child an opportunity to indicate his desire to look into the box. If the child does not respond within this time, a prompt is given. d. If the child still fails to respond, the box is taken away.
9. peg board & pegs mallet	a. Examiner pounds a peg in the pegboard with the mallet. b. Examiner hands the board and pegs to the child and says NOW YOU DO IT. The examiner retains the mallet, however. c. The child has 15 seconds to indicate that he needs the mallet. If he does not respond within this time, a prompt is given. d. If the child still fails to respond, the peg board and mallet are placed back in the box.
10. picture of playing children	a. Examiner shows the picture of playing children to the child. b. Examiner says THESE CHILDREN ARE PLAYING. YOU WANT TO PLAY, TOO. WHAT WOULD YOU DO? c. The child has 30 seconds in which to respond. If he has not responded within this time, a prompt is given. d. If he still fails to respond,the picture is placed back in the box.
11. doll with bandage on her leg	a. Examiner presents the doll and says THIS DOLLY FELL DOWN AND HURT HER LEG. HOW DOES SHE FEEL?

TOC (cont.)

	Materials	Instructions
		b. The child has 30 seconds in which to respond. If he has not responded within this time, a prompt is given. c. If he still fails to respond, the doll is placed back in the box.
12.	story poster	a. Examiner shows the child the poster. b. Examiner says TELL ME A STORY ABOUT THIS. c. The child has 45 seconds in which to respond. If he does not respond, a prompt is given. d. If he still fails to respond, the poster is placed back in the box.
13.	story poster cover sheet which is 1/3 the size of the poster	a. Examiner shows the child the poster which has been partially covered by the cover sheet. b. Examiner says TELL ME A STORY ABOUT THIS. c. The child has 15 seconds to indicate that part of the poster is covered. If he does not respond within this time, a prompt is given. d. If he still fails to respond, the poster is placed back in the box.
14.	record player record of singing children	a. Examiner places record on the player and says NOW WE ARE GOING TO LISTEN TO SOME LITTLE CHILDREN SING A SONG. b. Examiner sets the record player on the lowest speed so that the sound will be distorted. c. The child has 30 seconds to indicate that the record sounds strange. If he does not respond within this time, a prompt is given.

TOC (cont.)

Materials	Instructions
	d. If the child still fails to respond, the record is taken off the player and is put back in the box.
15. child-proof jar M&M's	a. Examiner places M&M's in the child-proof jar. b. Examiner tells child that he can have an M&M, and hands the jar to the child. c. The child has 15 seconds to indicate he needs help in opening the jar. If he does not respond within this time, a prompt is given. d. If the child still fails to respond, the jar is opened by the examiner and the child is given an M&M, but is given a score of "0" for this item.

TEST OF COMMUNICATIVENESS
(Score Sheet)

Child's Name_____

*Circle the appropriate number for each test item. Date_____

TEST ITEM	NO RESPONSE	RESPONSE AFTER PROMPTING	MINIMAL SPONTANEOUS RESPONSE	ADEQUATE SPONTANEOUS RESPONSE	ELABORATE SPONTANEOUS RESPONSE
1	0	1	2	3	4
2	0	1	2	3	4
3	0	1	2	3	4
4	0	1	2	3	4
5	0	1	2	3	4
6	0	1	2	3	4
7	0	1	2	3	4
8	0	1	2	3	4
9	0	1	2	3	4
10	0	1	2	3	4
11	0	1	2	3	4
12	0	1	2	3	4
13	0	1	2	3	4
14	0	1	2	3	4
15	0	1	2	3	4

TEST OF COMMUNICATIVENESS SCORE_____

APPENDIX D. Raw Data

Table 9

Number of Initiative Communication Attempts Made by Preschoolers from Day-Care Center A

Subject	No. of Initiative Communication Attempts			
	Day 1	Day 2	Day 3	Average
A	8.0	8.0	7.0	7.6
B	6.0	7.0	9.0	7.3
C	8.0	9.0	10.0	9.0
D	7.0	8.0	8.0	7.7
E	6.0	6.0	8.0	6.6
F	12.0	12.0	17.0	13.6
G	8.0	6.0	6.0	6.6
H	4.0	4.0	3.0	3.6
I	3.0	8.0	7.0	6.0

Table 10

Number of Initiative Communication Attempts Made by Preschoolers from Day-Care Center B

Subject	No. of Initiative Communication Attempts			
	Day 1	Day 2	Day 3	Average
J	6.0	7.0	10.0	7.6
K	5.0	4.0	4.0	4.3
L	5.0	7.0	6.0	6.0
M	7.0	9.0	8.0	8.0
N	3.0	6.0	6.0	5.0
O	7.0	11.0	9.0	9.0
P	11.0	8.0	8.0	9.0
Q	5.0	4.0	5.0	4.6
R	1.0	6.0	4.0	3.6
S	6.0	3.0	9.0	6.0
T	8.0	5.0	2.0	5.0
U	12.0	8.0	9.0	9.6
V	11.0	12.0	10.0	11.0
W	12.0	9.0	9.0	10.0
X	7.0	5.0	6.0	6.0
Y	3.0	1.0	2.0	2.0
Z	5.0	7.0	8.0	6.6
AA	5.0	9.0	6.0	6.6

Table 11

Scaled Scores Assigned by Teachers
from Day-Care Center A

Subject	Scaled Scores		
	Teacher #1	Teacher #2	Mean Scaled Score
A	8.0	8.0	8.0
B	8.0	5.0	6.5
C	8.0	7.0	7.5
D	9.0	6.0	7.5
E	5.0	3.0	4.0
F	6.0	5.0	5.5
G	9.0	6.0	7.5
H	6.0	4.0	5.0
I	7.0	5.0	6.0

Table 12

Scaled Scores Assigned by Teachers
from Day-Care Center B

Subject	Scaled Scores		
	Teacher #1	Teacher #2	Mean Scaled Score
J	9.0	9.0	9.0
K	8.0	3.0	5.5
L	5.0	1.0	3.0
M	8.0	4.0	6.0
N	9.0	9.0	9.0
O	8.0	5.0	6.5
P	9.0	3.0	6.0
Q	7.0	4.0	5.5
R	5.0	1.0	3.0
S	6.0	2.0	4.0
T	6.0	1.0	3.5
U	5.0	3.0	4.0
V	9.0	9.0	9.0
W	7.0	3.0	5.0
X	6.0	4.0	5.0
Y	7.0	1.0	4.0
Z	8.0	3.0	5.5
AA	9.0	9.0	9.0

Table 13

TOC Scores for Preschoolers from Day-Care Center A

Subject	Test Items															Mean Scaled Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
A	3	4	3	3	4	1	2	3	4	3	4	3	3	1	2	2.8
B	3	4	3	4	1	1	3	3	2	1	4	1	1	2	1	2.2
C	3	3	2	2	3	3	4	1	3	3	4	3	3	3	1	2.7
D	2	3	3	3	3	3	3	1	3	3	3	4	4	3	3	2.9
E	1	0	2	3	2	2	3	1	2	0	1	0	0	1	1	1.3
F	4	3	3	3	3	3	4	4	3	2	3	3	3	4	3	3.2
G	3	4	3	3	4	1	1	4	3	3	3	3	3	3	1	2.8
H	3	4	4	0	3	3	3	2	3	0	1	3	0	1	1	2.0
I	2	2	3	3	3	1	3	1	3	1	0	1	1	1	1	1.7

Table 14

TOC Scores for Preschoolers from Day-Care Center B

Subject	Test Items															Mean Scaled Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
J	3	3	3	3	3	3	1	2	1	2	2	0	1	3	3	2.2
K	3	3	3	3	2	3	2	1	0	0	3	2	4	1	3	2.2
L	3	3	3	3	3	0	2	2	1	0	3	1	3	3	3	2.2
M	3	3	3	3	4	3	1	3	3	3	3	3	4	3	3	3.0
N	4	3	3	3	3	3	2	4	3	3	3	3	4	4	3	3.2
O	3	3	1	3	3	3	0	3	3	3	3	3	4	3	3	2.7
P	3	3	3	3	3	2	0	3	2	3	3	2	3	3	3	2.6
Q	1	3	3	3	3	2	0	3	2	3	3	3	3	3	3	2.5
R	0	2	2	0	0	0	2	3	0	1	0	1	0	0	0	.7
S	4	3	3	3	3	3	1	3	3	3	1	2	3	3	0	2.5
T	3	3	3	3	3	3	2	3	3	3	0	0	3	3	3	2.5
U	3	3	2	3	3	2	1	3	0	3	3	3	3	3	3	2.5
V	3	3	3	3	3	3	3	3	3	3	3	3	4	4	3	3.1
W	3	3	3	4	3	3	3	3	3	3	3	3	4	3	3	3.1
X	1	2	2	2	1	2	0	3	0	0	1	1	3	3	1	1.5
Y	1	2	2	1	2	0	2	2	1	0	0	2	1	1	3	1.3
Z	3	1	2	3	3	2	3	3	3	3	1	1	3	1	3	2.3
AA	1	3	3	3	3	3	2	3	2	1	3	3	3	3	3	2.6

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