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A Comparison of Two Methods of Recording and Analyzing Student Clinician-Client Interaction: Boone and Prescott System and the ABC System

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A COMPARISON OF TWO METHODS OF RECORDING AND ANALYZING STUDENT CLINICIAN-CLIENT INTERACTION: BOONE AND PRESCOTT SYSTEM AND THE ABC SYSTEM

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ABSTRACT

This study was designed to analyze and compare two objective methods of recording clinician-client interaction: The Boone and Prescott System and the Analysis of Behaviors of Clinician (ABC) System, in terms of the information each system presents. Since eight categories on both systems are similar, the systems were analyzed using the eight similar categories, then analyzed using all categories in both systems. The systems were analyzed in terms of total number of observations and rank order of categories.

Subjects for this study were eight undergraduate clinicians from the Department of Speech Pathology and Audiology at the University of North Dakota. The clinicians were involved in articulation and language therapy with clients from four to six years of age. Each clinician was videotaped for ten consecutive minutes during each of three forty-minute therapy sessions. Each ten-minute sample was analyzed using both objective systems of recording clinician-client interaction.

When the total number of observations from the entire Boone and Prescott System and the entire ABC System were compared, the difference was nonsignificant at the .05 significance level. However, when only the eight similar categories of both systems were compared, the Boone and Prescott System yielded significantly more observed behaviors at the .01 significance level. When the similar behaviors from each

system were compared, a significant difference at the .05 level resulted in three categories and at the .01 level in one category.

CHAPTER I

INTRODUCTION AND REVIEW OF LITERATURE

The importance of skill in observing and recording behavior has been recognized as an important part of the therapy process. Observation of communicative behavior is the foundation for diagnosis and therapy in speech and language disorders. Techniques for observing communicative behavior should be taught as one of the early steps in the clinical training program. The training program should help the student distinguish between descriptions of behavioral events and statements of impressions resulting from observation of behavioral events.

Clinical supervisors must observe and evaluate not only the client's performance and the clinician's ability to plan and carry out a therapy session, but clinician-client interaction as well. Objective systems for recording and analyzing behavior have been developed recently and have been found to be effective in helping the clinician to modify the therapy session.

The purpose of the study was to compare information obtained by two different procedures of recording clinician-client interaction. One system is a behavioral based procedure (Boone and Prescott Ten Category System) and the other is a behavioral-time based procedure (Analysis of Behaviors of Clinicians System).

Chronological Review of the Literature

The profession of Speech Pathology is very much concerned with improving the quality of clinical preparation. However, until recently, a search of professional journals revealed little evidence of concern for the problem of supervision of clinical practice.

Supervision of the transition from academic proficiency to clinical application has been either downgraded or neglected. Halfond (1964) stated that there is evidence that supervision is a stepchild in the educative process. He stated that supervision is a process in which the direct application of information about communication disorders is reviewed by the supervisor and clinician. Supervision also implies the giving of direction and the maintenance of some controls.

Powers (1956) stated that college professors who train young people for public school speech correction too often lack direct experience in this work themselves. She also listed several criteria by which the supervisor could evaluate the clinician. The criteria included:

1. Organization of speech correction program
2. Examination and diagnosis of cases
3. Speech therapy
4. Professional relationships
5. Personal characteristics
6. Professional attitudes and ethics

Bloomer (1956) stated a need to re-evaluate and re-define standards of professional training in order to better serve students and clients. He indicated training standards are vague and the nature of clinical work

has never been defined. His summary stated that members of the American Speech and Hearing Association must review training objectives and define the educational procedure for achieving them.

Black, Miller, Anderson, and Coates (1961); Irwin, Van Riper, Breakey, and Fitzsimmons (1961); and Pronovost, Wells, Gray, and Sommers (1961) were in agreement that immediate research into the clinical supervisory task is necessary. Black, et al., indicated an apparent discrepancy between doctrine and practice. Irwin, et al., stated that supervision was inadequately provided to the student in the public school practice teaching and in his practicum in the clinical setting. Pronovost, et al., stated that research undertaken by supervisors often concerns itself with incidence and case load, rather than with effectiveness of methods.

Halfond (1964) stated that one outstanding lack in training is in the supervisory aspect of the clinical practicum. He emphasized that while an attempt has been made to upgrade the profession, little special competence and training of the supervisory personnel has been required.

Van Riper (1965, p. 77) and Ward and Webster (1965) attempted to stimulate research in the area of clinical supervision. Van Riper stated:

> . . . We discern a general tendency in our field to view supervision of clinical practice as being of much less importance than teaching or research. If so, this is a tragic situation since our profession rests upon a broad foundation of casework. . . . Our major purpose is to train our students to be clinicians. In this training center, we place supervision first.

The need for student clinicians to observe and study themselves was stressed by Ward and Webster. They stated that clinical supervision is regarded as an interactive process between student and supervisor in which both are working together to find the most productive way of effecting the therapeutic relationship. This concept implies that both clinician and supervisor need a more effective and objective manner in which to examine clinical behavior.

Matthews (1966), in a special report on the essentials of an acceptable program of training for speech pathologists, emphasized that the practicum must be adequately supervised. He stated that the supervisor should observe therapy sessions frequently enough to be fully acquainted with the problems presented, the capabilities of the student, and the progress made. Brooks and Hannah (1966) indicated that supervision might be improved through the use of an auditory system which enables the supervisor to speak directly to the clinician without the client being aware of the communication. The most helpful feature here has been the provision of immediate reinforcement of desired behavior on the part of the clinician and discouragement of inappropriate behavior.

Miner edited one of the most comprehensive reports on clinical supervision to be found in the literature. Miner stated:

> It is that quality of supervision which enables the young clinician to master the necessary skills of practicum, of evaluation and of human relationships, and further motivate him to a constant self-appraisal of his clinical competence and a search for additional knowledge which will improve his competence.

Prather stated that supervision which is client-focused instead of therapist-focused seems to be effective in developing clinical skills. She stated that as the supervisor discusses the behavior of the child, he also discusses the behavior of the clinician, but only as it related to what the child did within that particular therapy session. Kunze emphasized that without the ability of observe behavior, the clinical student or the professional clinician is unable to evaluate critically his own performance. The importance of skill in behavioral observation has been recognized as the foundation upon which diagnosis and treatment are developed, but the necessity for training students in this basic skill has been ignored. Kunze stated that techniques in the observation of behavior should be taught as the first step in the clinical training program. He stressed the importance of objective recordings of behavioral events and stated that the purposes of recording behavioral events rather than impressions might be as follows:

1. Recording of behavioral events preserves data which are lost when only impressions are noted. . . .
2. Recording of behavioral events preserves data which may have no importance when considered alone, but which assumes importance in relation to other behaviors emitted at other times. . . .
3. When impressions are recorded, a conclusion is drawn on the basis of the one behavioral event just observed or on a series of events vaguely recalled. . . .
4. Being objective in nature, behavioral event records cannot be distorted by observer bias. . . .

Rees and Smith (1967) conducted a study relating dissatisfaction with clinical supervision. They indicated supervisors' procedures for evaluating students need to be improved.

Schubert (1968) conducted a survey to determine the criteria most frequently used in evaluating student clinicians. Responses from thirty-one institutions in the United States indicated a range of four to forty-seven criteria. The ten most frequently reported criteria were translated into behavioral terms as follows:

1. Demonstrates ability to accomplish identified goals
2. Shows understanding of client's speech problems and his secondary problems
3. Establishes rapport
4. Exhibits professional attitudes
5. Displays adequate personal appearance and hygiene
6. Plans therapy to accomplish goals of therapy
7. Attends to therapy setting and clinical materials
8. Demonstrates knowledge of communication problem
9. Demonstrates reliability and dependability
10. Uses appropriate voice, speech and language

Darley (1969) emphasized that supervision should be more than nominal. The supervisor, by reading therapy logs, cannot determine whether or not correct procedures are being used. He must regularly observe and critique the therapy session. Darley stated that to achieve first rate patient care, clinical experience should be bolstered and enriched under the watchful eye of master clinicians in setting that provide interprofessional stimulation and influence. Stace and Drexler (1969) conducted a study to assess the practices of special preparation for supervisors of student trainees, the attitudes of these

supervisors toward special preparation, and the supervisors' suggestions for special preparation for supervisors.

Irwin and Nickles (1970) used audiovisual films to teach students to be more objective in observing the therapy process. They stated that films enable the student to obtain needed supervised observation in a controlled situation. Falck (1972) stated that with practice the student clinician will develop clinical skills, especially if the supervisor is associated with the experiences of the student.

Boone (1970) suggested the use of a therapy-scoring instrument to enable the supervisor to quantify the events and sequences of therapy. He stated that a therapy-scoring instrument can create an awareness of what clinicians are doing in therapy as well as what clients are doing.

Anderson (1973) conducted a survey based on data about school practice in speech pathology and audiology programs. She stated that many practicum programs throughout the country were not supervised by speech pathology and audiology departments. She stated that requirements for supervising clinicians are minimal. Anderson stressed an urgent need to investigate the efficiency and effectiveness of supervision and the school practicum.

Objective Methods of Observing and Recording Behaviors

Until recently, there has been a lack of organized observational systems in the teaching and clinical situations. One of the first organized methods of recording group behavior was developed by Flanders at the University of Minnesota between 1955 and 1960. This system was entitled "Flanders' Interaction Analysis Categories." It was designed

for student teachers to learn to control and modify their behavior in the classroom.

Flanders (1970, pp. 28-29) stated:

> Interaction analysis refers not to one system, but to many systems for coding spontaneous verbal communication, arranging the data into useful display, and then analyzing the results in order to study patterns of teaching and learning. Each system is essentially a process of encoding and decoding, i.e., categories for classifying statements are established, a code symbol is assigned to each category and a trained observer records data by jotting down code symbols. Decoding is the reverse process: a trained analyst interprets the display of coded data in order to make appropriate statements about the original events which are encoded. . . .

Schubert (1972) stated that interaction analysis is the identification and study of events that take place between two or more people. An event is the behavior which occurs within a given time and is recorded by an observer using a coded system.

The purpose of interaction analysis is to study teaching behavior, then help an individual develop and control his teaching behavior. Interaction analysis can be useful whenever it is necessary to record the presence or absence of particular behavior patterns during a period of observation.

Interaction analysis, commonly referred to as an observation system, is used in various professions. It is used in psychotherapy, in business and industry, in medical training centers and in universities where student teachers are trained.

The Flanders' System includes ten categories: seven are used when the teacher is talking, two are used when any pupil is talking, and the last category is used to indicate silence or confusion. The

seven categories which incorporate teacher talk are: accepts feelings, praises or encourages, accepts or uses ideas of pupils, asks questions, lectures, gives directions, critizes or justifies authority. The categories which incorporate pupil talk are: pupil talk-response and pupil talk-initiation. Flanders indicated that these ten categories exhaust all possible events which can occur in the classroom.

The Flanders' System is used by an observer in the classroom. The observer decides which category best represents the communication events just completed. He then writes down this category number. Observation continues at a rate of approximately twenty tallies per minute, or a tally every three seconds. This system provides teachers with feedback about their teaching behavior and the quantity of pupil participation in the classroom.

The first use of interaction analysis for observation and supervision of clinical practicum in speech pathology was in 1970. Schubert and Miner (1971) developed an observation system based directly on the Flanders' System. They titled their observation system the "Modification of Flanders' Interaction Analysis Categories for Observation in Speech Therapy." This system encompassed twelve categories: eight categories related to clinician behavior, two related to client behavior and two related to both clinician-client behavior. The categories which pertained to clinician behavior were: accepts client's responses and uses them, instructs and demonstrates, uses audio-stimulation and questions, uses visual stimulation and questions, uses audio and/or visual reinforcement of client's correct responses,

relates useless information and asks impertinent questions, criticizes or uses authority, uses reinforcement of incorrect response. The client categories were: client's response to direct stimulus of the therapist and client's response unrelated to changing the speech problem. The last two categories which pertained to both clinician and client behavior were confusion and silence. Recording of behavior was done at three second intervals.

Schubert (1972, p. 24) stated that the Schubert and Miner System was developed "to quantify the behaviors observed during the therapy session, and to enable the supervisor and clinician to recall and analyze the sequential patterns which had occurred."

Another interaction analysis system was developed in 1970. Boone (1970), and Prescott (Boone and Prescott, 1972) developed an analysis system for the purposes of clinical self-evaluation. Based on an operant stimulus-response paradigm, the Boone and Prescott System allowed the clinician to quantify his behavior for self-evaluation.

The Boone and Prescott System consists of five categories relating to clinician behavior and five relating to client behavior. The category number, title and description of the Boone and Prescott System are shown in Table 1.

When using the Boone and Prescott System, the clinician or supervisor records a mark (-) which corresponds to the particular behavior occurring at that time. The sequences of behavior are categorized by plotting each observed behavior on an appropriate recording form (Appendix I). Prescott (1970) found, in analyzing

TABLE 1

BEHAVIORAL CATEGORIES AND DESCRIPTION OF EACH CATEGORY OF THE BOONE AND PRESCOTT SYSTEM

	Category	Definition
1.	EXPLAIN, DESCRIBE	Clinician describes and explains the specific goals or procedures of the session.
2.	MODEL, INSTRUCTION	Clinician specifies client behavior by direct modeling or by specific request.
3.	GOOD EVALUATIVE	Clinician evaluates client response and indicates a verbal or non-verbal approval.
4.	BAD EVALUATIVE	Clinician evaluates client response as incorrect and given a verbal or non-verbal disapproval.
5.	NEUTRAL-SOCIAL	Clinician engages in behavior which is not therapy goal oriented.
6.	CORRECT RESPONSE	Client makes a response which is correct for clinician instruction or model.
7.	INCORRECT RESPONSE	Client makes incorrect response to clinician instruction or model.
8.	INAPPROPRIATE-SOCIAL	Client makes response which is not appropriate for session goals.
9.	GOOD SELF-EVALUATIVE	Client indicates awareness of his own correct response.
10.	BAD SELF-EVALUATIVE	Client indicates awareness of his own incorrect response.

numerous tapes, that the number of different events in therapy correlated highly with the total time of each event. The data showed

that timing of therapy events during the scoring of a therapy session did not provide any more data to the scorer than the mere frequency summation of events.

Boone and Prescott (1971) stated that the reason therapy tapes (either audio or video) are scored, is to find out what happens in therapy. Although their system may be used while viewing a session live, or with audio or video tape, Boone and Prescott stated that the obvious advantage of scoring a taped segment is that the tape can be stopped and/or restarted for the scorer's convenience.

With the use of a scoring system, it is possible to categorize the behavior of both the clinician and the client. The events of therapy may be placed in the sequential order in which they occurred. The scoring system will also isolate the specific behavior of the clinician when the client makes a correct response and what the clinician does when the client makes an incorrect response. Boone and Prescott (1971) stated that quantification of therapy may enable the therapist to look at therapy effectiveness. Historically, speech pathologists and audiologists have placed clinical focus on client pre- and post-evaluation with little emphasis given to evaluating the extensive therapy process which lies between pre- and post-testing.

During 1971-72, the Modified Flanders' System was used in a pilot study conducted at the University of Washington and the University of North Dakota. Schubert (1972, p. 28) stated that "the pilot study served as a means of evaluating the usefulness of the system itself." Supervisors were asked to comment and suggest modifications of the

system. From these suggestions, the Analysis of Behaviors of Clinicians (ABC) System was devised. The ABC System consists of eight categories pertaining to clinician behavior, three to client behavior, and one joint category pertaining to both clinician and client. The category numbers, title and description of the ABC System are shown in Table 2.

Recording of data, using the ABC System, is done at three second intervals. Raw data are collected by utilizing a coded number system related to the specific type of clinician-client interaction. Each number corresponds to the specific type of interaction which occurs during the three second interval immediately preceding the recording. Like the Boone and Prescott System, the ABC System enables the clinician and/or supervisor to look objectively at the therapy process.

Since the development of the Boone and Prescott System and the ABC System, there have been further attempts at identifying clinical behavior as an objective process. Prescott (1970) developed a nineteen category system, based generally on an operant model. Olsen (1972) completed a doctoral study which compared sequential event differences between clinicians and communication disorder types. Prescott and Tesauro (1972) developed a system for objectively scoring and qualifying communication interactions of parents and their hearing impaired children as they occur is a simulated home environment. To accomplish this aim, a seventeen category system was developed. Laird (1973) conducted a study to determine the length of time necessary

TABLE 2

BEHAVIORAL CATEGORIES AND DESCRIPTION OF EACH CATEGORY OF THE ABC SYSTEM

	Category	Definition
Clinician Behavior	1. OBSERVING AND MODIFYING LESSON APPROPRIATELY	Using response or action of the client to adjust goals and/or strategies
	2. INSTRUCTION AND DEMONSTRATION	Process of giving instruction or demonstrating the procedures to be used
	3. AUDITORY AND/OR VISUAL STIMULATION	Questions, cues, and models intended to elicit a response
	4. AUDITORY AND/OR VISUAL POSITIVE REINFORCEMENT OF CLIENT'S CORRECT RESPONSE	Process of giving any positive response to correct client response
	5. PUNISHMENT	Process of giving any negative response to an incorrect client response
	6. AUDITORY AND/OR VISUAL POSITIVE REINFORCEMENT OF CLIENT'S INCORRECT RESPONSE	Process of giving any positive response to an incorrect client response
	7. CLINICIAN RELATING IRRELEVANT INFORMATION AND/OR ASKING IRRELEVANT QUESTIONS	Talking and/or responding in a manner unrelated to changing speech patterns
	8. USING AUTHORITY OR DEMONSTRATING DISAPPROVAL	Changing social behavior from unacceptable to acceptable behavior
Client Behavior	9. CLIENT RESPONDS CORRECTLY	Client responds appropriately, meets expected level
	10. CLIENT RESPONDS INCORRECTLY	Client apparently tries to respond appropriately but response is below expected level
	11. CLIENT RELATING IRRELEVANT INFORMATION AND/OR ASKING IRRELEVANT QUESTIONS	Talking and/or responding in a manner unrelated to changing speech patterns
	12. SILENCE	Absence of verbal and relevant motor behavior

to obtain a representative sample of clinician-client interaction during a therapy session, employing the ABC System to record behaviors.

The use of scoring systems has been found to be an effective measure for confronting oneself after therapy, a tool for use by the supervisor, and a sensitive device for studying the clinical processes of speech and hearing therapy.

Purpose and Questions

The purpose of this study was to compare information obtained by two different procedures of recording clinician-client interaction. One system is a behavioral based procedure (Boone and Prescott System) and the other is a behavioral-time based system (Analysis of Behaviors of Clinicians System).

The study was designed to answer the following specific questions:

1. Is there a significant difference between the total number of observations obtained when comparing the entire Boone and Prescott System (ten categories) to the entire ABC System (twelve categories)?
2. Is there a significant difference between the total number of observations obtained from each system when comparing only the eight categories which are similar?
3. Is there a significant difference between the number of observations obtained from each of eight categories of the Boone and Prescott System when compared to the eight similar categories of the ABC System?

4. What is the relationship in the rank order of the eight similar categories of the two systems?

CHAPTER II

PROCEDURE

Subjects

The subjects for this study were eight undergraduate student clinicians majoring in Speech Pathology and Audiology at the University of North Dakota. These clinicians were involved in articulation and language therapy with clients from four to six years of age. The clients met the following requirements:

1. Their receptive language scores fell within the range of "average learners, 90-109" as measured by the Peabody Picture Vocabulary Test.
2. Their hearing was equal to or better than 20dB ISO as measured by a pure-tone audiometer.
3. They were free of any organic involvement that might cause speech and/or language abnormalities as determined by the speech pathologist who administered the initial evaluation.

Instruments and Environment

For collection of data, the following instruments were used:

1. Ampex camera Model 3074
2. Ampex recorder Model VR5100 and Ampex recorder Model VR7000
3. Shibaden monitor Model VM 903 and Setchell-Carlson monitor Model 2100 SD

4. One inch Memorex videotape

5. Electro-voice microphone Model 664

Two therapy rooms were used. Each room was outfitted with a table and two chairs. On the wall of the experimenter's room adjacent to the experimental room was a one-way mirror which allowed the television camera to photograph behaviors without interferring with clinician or client. The videotape recorder was located in the experimenter's room.

Explanation of Systems

Although the Boone and Prescott System differs from the ABC System in total number of behavioral categories, certain categories within these two systems are similar. Eight categories within the Boone and Prescott System are similar to eight within the ABC System. These similar categories are shown in Table 3. Categories 9 and 10 within the Boone and Prescott System and Categories 1, 6, 8, and 12 within the ABC System are dissimilar and cannot be compared. However, these categories were included during collection of data.

The major difference between the two systems is the criteria for recording behaviors. When the Boone and Prescott System is used, recording of data is determined by change in behavior, while recording of data is time based when the ABC System is used.

The eight similar categories are identified by digit-dash-digit. The first digit refers to the Boone and Prescott System, while the last digit refers to the ABC System. For example, Categories (1-2) identifies Category 1 (Explain, Describe) within the Boone and Prescott System and Category 2 (Instruction and Demonstration) within the ABC System.

These two categories are similar. Categories (2-3) identifies Model and Stimulation, in which Category 2 in the Boone and Prescott System and Category 3 in the ABC System are similar.

TABLE 3

SIMILAR CATEGORIES OF THE BOONE AND PRESCOTT SYSTEM AND THE ABC SYSTEM

Boone and Prescott System	ABC System
1. EXPLAIN AND DESCRIBE	2. INSTRUCTION AND DEMONSTRATION
2. MODEL AND INSTRUCTION	3. AUDITORY AND/OR VISUAL STIMULATION
3. GOOD EVALUATIVE	4. AUDITORY AND/OR VISUAL POSITIVE REINFORCEMENT OF CLIENT'S CORRECT SOUND
4. BAD EVALUATIVE	5. PUNISHMENT
5. NEUTRAL-SOCIAL	7. CLINICIAN RELATING IRRELEVANT INFORMATION
6. CORRECT RESPONSE	9. CLIENT RESPONDS CORRECTLY
7. INCORRECT RESPONSE	10. CLIENT RESPONDS INCORRECTLY
8. INAPPROPRIATE-SOCIAL	11. CLIENT RELATING IRRELEVANT INFORMATION

Procedure

Each clinician was videotaped for ten consecutive minutes during each of three forty-minute therapy sessions. No recording of behavior was done during the initial or final five minutes of any session. The ten-minute segment was selected (at the discretion of the investigator) from the thirty possible minutes. Each ten-minute sample was analyzed

using both objective systems of recording clinician-client interaction. When the Boone and Prescott System was used, behaviors were recorded as they occurred, by plotting a number which corresponded to the appropriate category within the system. This represented a modification in the procedure of recording behaviors described by the authors of the system. The modification in the scoring procedure represented only a change in the method of recording behaviors. The categories of behavior remained unchanged. This modification was implemented to simplify recording procedures for the experimenter. Boone and Prescott's recording form is shown in Appendix I. The modified recording form is shown in Appendix II.

When the ABC System was used, data were collected by utilizing a coded number system. Every three seconds a number was plotted on the recording form (Appendix III). This number corresponded to the specific type of clinician-client interaction occurring during the three second interval immediately preceding the recording.

Each of the eight clinicians were videotaped three times for ten-minute segments. This resulted in a total of 240 minutes of observed clinician-client interaction. These behaviors were observed and categorized according to the procedures of both methods under consideration.

Following collection and categorization, the data was statistically analyzed. Chi Square and Spearman Rho Correlation were the procedures implemented.

Reliability

Intra-reliability was established preceding the collection of data and midway through the data collection process. This was done by viewing and scoring a given tape twice with a minimum time lapse of forty-eight hours, then calculating the percentage of agreement. The initial reliability for the Boone and Prescott System was 97 per cent while reliability midway was 96 per cent. The initial and midpoint reliability for the ABC System was 95 per cent. Four different tapes were arbitrarily selected and used for the reliability calculations.

Inter-reliability was established by having a second person transcribe the observed behaviors of the same ten-minute segment. This individual was a certified speech pathologist having considerable experience using both scoring systems. The agreement for the Boone and Prescott System was 96 per cent. The per cent reached for the ABC System was 97.

CHAPTER III

RESULTS AND DISCUSSION

Results

Question 1: Is there a significant difference between the total number of observations obtained when comparing the entire Boone and Prescott System (ten categories) to the entire ABC System (twelve categories)?

A total of 4891 observed behaviors was recorded using all ten categories in the Boone and Prescott System. This compared with 4800 observed behaviors in the ABC System when all twelve categories were used. The total numbers of observations for the Boone and Prescott System and the ABC System are shown in Table 4. Analysis using Chi Square procedure revealed a value of .84 with 1 degree of freedom. This value proved nonsignificant at the .05 level of significance. A contingency table for the totals of the entire Boone and Prescott System and the entire ABC System is shown in Table 5.

Question 2: Is there a significant difference between the number of observations obtained from each system when comparing only the eight categories which are similar?

When the eight similar categories in both systems were compared, 4799 observed behaviors were recorded using the Boone and Prescott System and 4425 observed behaviors were recorded using the ABC System.

TABLE 4

FREQUENCIES AND PER CENT OF OCCURRENCE FOR THE ENTIRE BOONE AND PRESCOTT SYSTEM (TEN CATEGORIES) AND THE ENTIRE ABC SYSTEM (TWELVE CATEGORIES)

Boone and Prescott System			ABC System		
Category	Frequency	Per cent	Category	Frequency	Per cent
1	132	2.7	1	1	.0
2	1379	28.2	2	149	3.1
3	740	15.1	3	1406	29.3
4	112	2.3	4	598	12.5
5	529	10.8	5	108	2.3
6	1035	21.2	6	4	.0
7	270	5.5	7	423	8.8
8	602	12.3	8	72	1.5
9	76	1.6	9	921	19.2
10	16	.3	10	224	4.7
	4891	100	11	596	12.4
			12	299	6.2
				4800	100

TABLE 5

CONTINGENCY TABLE FOR TOTALS OF THE ENTIRE BOONE AND PRESCOTT SYSTEM AND THE ENTIRE ABC SYSTEM

Systems	Observed Frequency	Expected Frequency
Boone and Prescott System	4891	4845.5
ABC System	4800	4845.5

Chi Square = .84
Table value required at .05 with 1 df = 3.84

Analysis using Chi Square procedure revealed a value of 24.0889 which was significant at the .01 level of significance. A contingency table for the number of observations using the eight similar categories of both systems is shown in Table 6.

TABLE 6

CONTINGENCY TABLE FOR THE NUMBER OF OBSERVATIONS USING THE EIGHT SIMILAR CATEGORIES OF BOTH SYSTEMS

	Boone and Prescott System		ABC System		
Category	Observed	Expected	Observed	Expected	Total
(1-2)	132	146.2	149	134.8	281
(2-3)	1379	1449.0	1406	1336.0	2785
(3-4)	740	696.1	598	641.9	1338
(4-5)	112	114.5	108	105.5	220
(5-7)	529	495.3	423	456.7	952
(6-9)	1035	1017.7	921	938.3	1956
(7-10)	270	257.0	224	237.0	494
(8-11)	602	623.3	596	574.7	1198
	4799	4799.1	4425	4424.9	9224

Chi Square - 24.0889
Table value required at .01 with 7 df - 18.5

When all categories from both systems were utilized, it was seen that the difference in the total number of behaviors was nonsignificant. These results showed that some of the dissimilar categories proved important in terms of frequency of occurrence of behavior. In the Boone and Prescott System, Category 9, Good

Self-Evaluative, was observed 76 times, or 1.6 per cent of the total behaviors, while Category 10, Bad Self-Evaluative, was observed 16 times or .3 per cent of the total behaviors. Categories 9 and 10 were used most often during therapy which employed the clinical strategy of post-articulation signaling, where the clinician provided a stimulus, the client responded and evaluated his own response as good or bad. These two categories were used by only two clinicians, each using operant approaches to therapy.

When the entire ABC System was used, the dissimilar category that occurred most frequently was Category 12, Silence. This behavior was observed 299 times or 6.2 per cent of the total behaviors. Category 8, Using Authority or Demonstrating Disapproval, occurred 72 times or 1.5 per cent of the total behaviors. When this behavior (Using Authority) occurred while using the Boone and Prescott System, it was reported in Category 5 (Neutral-Social). The use of Categories 1 and 6, when recording behaviors using the ABC System, was almost nonexistent.

Question 3: Is there a significant difference between the number of observations obtained from each of the eight categories within the Boone and Prescott System when compared to the eight similar categories within the ABC System?

Table 7 shows a contingency table for each similar category within the Boone and Prescott System and the ABC System. This table also shows the values reached when Chi Square procedure with 1 degree of freedom was performed on each of the eight similar categories. A difference in frequency of occurrence, significant at the .01 level of

significance, was found in the following categories: Category (3-4), Positive Reinforcement; Category (5-7), Client Relating Irrelevant Information; Category (6-9), Client Responds Correctly. At the .05 level of significance, Category (7-10), Client Responds Incorrectly, was found to be significant.

TABLE 7

CONTINGENCY TABLE FOR EACH SIMILAR CATEGORY WITHIN THE BOONE AND PRESCOTT SYSTEM AND THE ABC SYSTEM

Category	Boone and Prescott System Observed Frequency	Expected Frequency	ABC System Observed Frequency	Chi Square Value
(1-2)	132	140.5	149	1.03
(2-3)	1379	1392.5	1406	.2616
(3-4)	740	669	598	15.07[a]
(4-5)	112	110	108	.07
(5-7)	529	476	423	11.80[a]
(6-9)	1035	978	921	6.64[a]
(7-10)	270	247	224	4.28[b]
(8-11)	602	599	596	.03

a = significant at .01
b = significant at .05
Table value required at .05 with 1 df = 3.84
Table value required at .01 with 1 df = 6.63

As seen in Table 7, the ABC System yielded the highest frequency of occurrence in Categories (1-2) and (2-3), while the

Boone and Prescott System yielded the highest frequency of occurrence in the remaining six similar categories. Therefore, whenever a significant difference existed, as in Categories (3-4), (5-7), (6-9), and (7-10), the Boone and Prescott System always yielded the highest frequency of occurrences for the similar categories.

Although significant differences resulted in four of the eight similar categories, the percentages of occurrence for similar categories were very close. Figure 1 gives a clear indication of the likeness in percentage for each of the similar categories within both systems.

Question 4: What is the relationship in rank order of the eight similar categories of the two systems?

Using Spearman Rho Correlation procedure, a perfect positive correlation of 1.0 was reached, as the ranking for the eight similar categories was identical. The two systems are ranked in order of frequency of occurrences per category in Table 8.

TABLE 8

SIMILAR CATEGORIES IN THE BOONE AND PRESCOTT SYSTEM AND THE ABC SYSTEM ARRANGED IN ORDER OF RANK

Categories	Boone and Prescott System	ABC System
(2-3)	1379	1406
(6-9)	1035	921
(3-4)	740	598
(8-11)	602	596
(5-7)	529	423
(7-10)	270	224
(1-2)	132	149
(4-5)	112	108

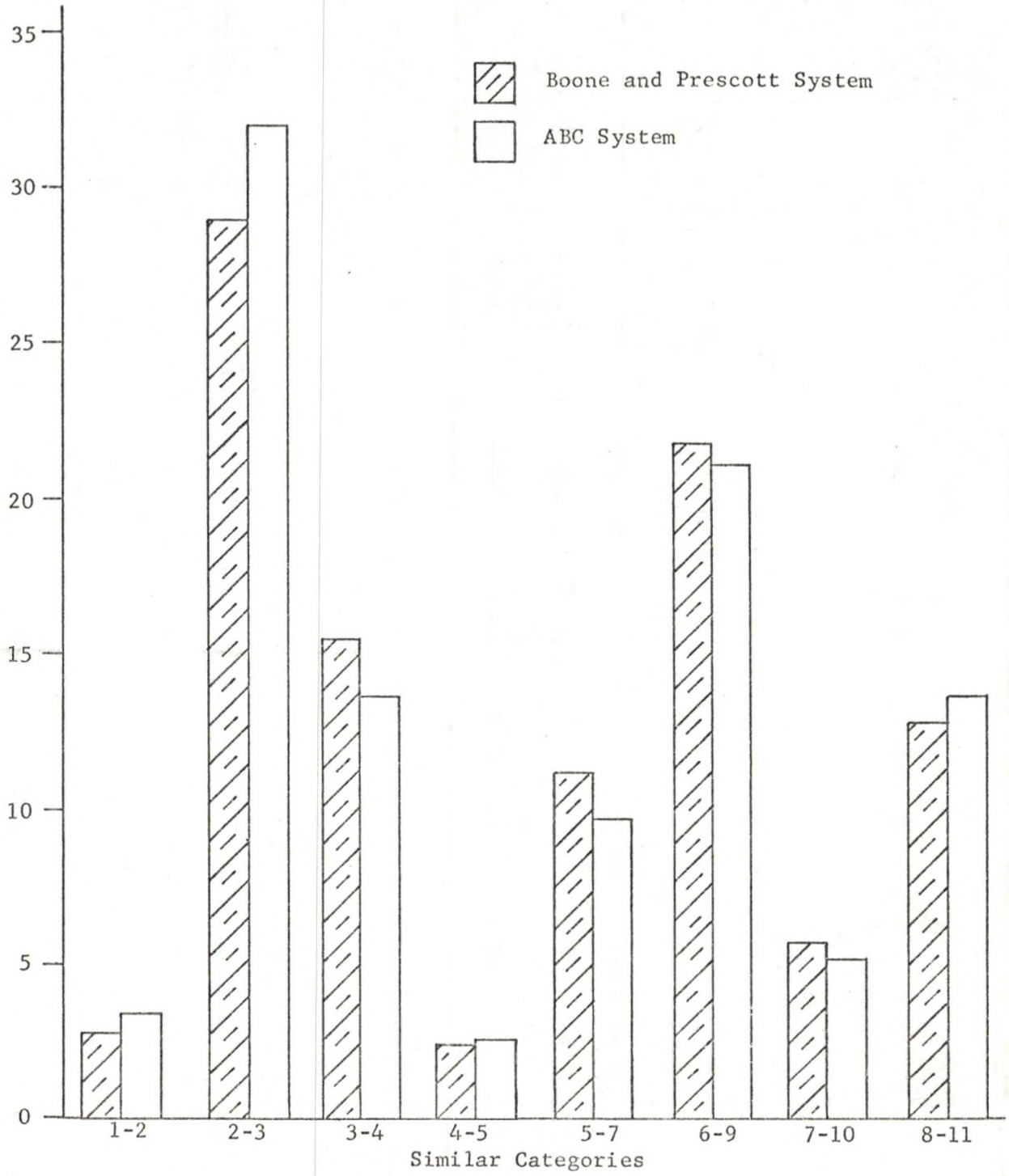


Fig. 1.--Percentages of the Eight Similar Categories of the Boone and Prescott System and the ABC System.

When the entire Boone and Prescott System (ten categories) was ranked according to frequency of occurrences of categories, Category 9 and 10 had the fewest occurrences. Table 9 shows the similarity in ranking the entire system as opposed to ranking the eight similar categories. Category 9, Good Self-Evaluative, was used much more often (1.6 per cent) than Category 10, Bad Self-Evaluative (.3 per cent).

TABLE 9

CATEGORIES WITHIN BOONE AND PRESCOTT SYSTEM ARRANGED IN ORDER OF RANK

Category	Category Name	Frequency	Rank Using Ten Categories	Rank Using Similar Eight Categories
2	Model and Instruction	1379	1	1
6	Correct Response	1035	2	2
3	Good Evaluative	740	3	3
8	Inappropriate-Social	602	4	4
5	Neutral-Social	524	5	5
7	Incorrect Response	270	6	6
1	Explain and Describe	132	7	7
4	Bad Evaluative	112	8	8
9	Good Self-Evaluative	76	9	
10	Bad Self-Evaluative	16	10	

Table 10 shows the ABC System ranked according to frequency of occurrences of categories. The entire system (twelve categories) is ranked as are the eight similar categories.

TABLE 10

CATEGORIES WITHIN ABC SYSTEM ARRANGED IN ORDER OF RANK

Category	Category Name	Frequency	Rank Using Twelve Categories	Rank Using Similar Eight Categories
3	Auditory and/or Visual Stimulation	1406	1	1
9	Client Responds Correctly	921	2	2
4	Positive Reinforcement	598	3	3
11	Client Irrelevant Information	596	4	4
7	Clinician Irrelevant Information	423	5	5
12	Silence	299	6	
10	Client Responds Incorrectly	224	7	6
2	Instruction and Demonstration	149	8	7
5	Punishment	108	9	8
8	Using Authority	72	10	
6	Positive Reinforcement of Incorrect Sound	4	11	
1	Observing and Modifying	1	12	

One variance exists in rank order of categories when analyzing the ABC System in terms of twelve categories and eight categories. Category 12, Silence, is ranked sixth when the entire system is analyzed. When only the eight similar categories are analyzed, Category 12 is disregarded and the other categories are identically matched. Categories 8, 6, and 1, the remaining dissimilar categories, are the three least frequently used.

Discussion

With the information collected, it was difficult to establish whether or not the two systems would provide the clinician with equivalent information. The ABC System is a sampling device which accounts for behavior every three seconds. It must be recognized that several behaviors could occur during the three second interval. When several behaviors do occur during this interval, the recorder is to chart the most prominent behavior. The Boone and Prescott System accounts for behaviors as they occur without regard to a time factor. Although this system enables the recorder to account for every behavior, the length of time spent on each behavior is not indicated. Consequently, some information is lost using either system.

Prescott's research (1970) showed that timing of therapy events during scoring of a therapy session did not provide any more information to the scorer than the mere frequency summation of events. It appeared in the present study that the two systems yielded approximately the same information when the therapy situation was basically stimulus, response, reinforcement, with a minimum amount of

irrelevant behavior. However, if there was a lengthy occurrence of a single particular behavior, the ABC System clearly showed this.

The number of seconds that a particular category of behavior persisted would be known using the ABC System, while the duration of the same behavior would be unknown using the Boone and Prescott System since the lengthy behavior would be given only one tally. An example of this was evident during the collection of data. During language therapy, one clinician read a story to the client. This was regarded as a stimulus in both systems, as the child eventually responded to questions about the story content. When this behavior was recorded using the Boone and Prescott System, a 2 (Model and Instruction) was recorded, followed by a 6 (Correct Response). When this same behavior was analyzed using the ABC System, a 3 (Auditory and/or Visual Stimulation) was recorded 47 times before 9 (Client Responds Correctly) was recorded. This means that the clinician stimulated the client for 141 seconds before the client was given an opportunity to respond. Here the ABC System gave a much clearer indication of the time spent using a given category.

The Boone and Prescott System and the ABC System were very similar in providing useful information during an efficient and well planned therapy session. However, when the therapy session did not move along efficiently, the ABC System gave more pertinent information in terms of amount of time spent on specific behaviors.

The recording of behaviors within the Boone and Prescott System, as adapted for this study, was done with greater ease than for the ABC

System. This was attributed to recording behaviors as they occurred and not having to contend with a timed interval. When using the ABC System, it was often difficult to follow the timed interval accurately. Occasionally more than one important behavior would occur during the three second interval. When this happened, it was often difficult to decide which behavior to chart.

Certain categories within the ABC System occurred less frequently than others. Category 1, Observing and Modifying Lesson Appropriately, was observed and recorded only once in 4800 recorded behaviors. The implication here is that clinicians did not recognize and grasp opportunities to modify their therapy, nor did they relate unexpected occurrences to their planned therapy objectives. However, it is possible that the behavior identified in Category 1 simply occurs at low frequency during most therapy sessions. In previous research by Schubert (1972) and Laird (1973), this category was also used infrequently. Category 6, Auditory and/or Visual Positive Reinforcement of Client's Incorrect Response, was observed and recorded only 4 times in 4800 recorded behaviors. Previous research by Schubert and Laird support the infrequent usage of this category. Perhaps this category would be used more if clinicians had not learned to discriminate among, and listen carefully to, client's responses. Category 8, Using Authority or Demonstrating Disapproval, was used 72 times in 4800 recorded behaviors. In Laird's research, this category was ranked tenth in the twelve categories in terms of frequencies of occurrences. In the present research, Category 8 was also ranked tenth of the twelve categories.

Although Category 12, Silence, was not one of the eight similar categories, it appeared to be important. This category was used 299 times or 6.2 per cent of observed time. In Schubert's research, this category was used 6.6 per cent of the time.

Within the Boone and Prescott System, Category 9 and 10, Good Self-Evaluative and Bad Self-Evaluative, were used infrequently (76 and 16 times of 4891 recorded behaviors). However, these categories are important and developments in therapy techniques suggest that in the future more emphasis may be placed on client self-evaluation.

Both the Boone and Prescott System and the ABC System can provide the clinician and/or supervisor with a great deal of information about the therapy session. Both systems are useful in changing clinician behavior by providing objective information pertaining to clinician-client interaction.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Clinical supervision is an interactive process between student and supervisor where both are working together to find the most productive way of effecting the therapeutic relationship. This concept implies that both clinician and supervisor need an effective and objective manner to examine clinical behavior.

The purpose of the study was to compare information obtained from two different procedures of recording clinician-client interaction. One system is a behavioral based procedure (Boone and Prescott System) and the other is a behavioral-time based procedure (Analysis of Behaviors of Clinicians System).

The subjects were eight student clinicians at the University of North Dakota involved with clients in articulation and language therapy. Each clinician was videotaped for ten minutes of each of three therapy sessions. Each ten-minute sample was analyzed using both objective systems of recording clinician-client interaction.

Questions one, two, and three were statistically analyzed using Chi Square procedure. Question four was analyzed using Spearman Rho Correlation.

Conclusions

From this study the following conclusions were drawn:

1. When the total number of observations from the Boone and Prescott System (ten categories) were compared to the total number of observations from the ABC System (twelve categories), the difference was found to be nonsignificant at the .05 level.
2. When the total number of observations from the eight similar categories of both systems were compared, the difference was found to be significant at the .01 level.
3. When the number of behaviors from similar categories were compared, Categories (3-4), Positive Reinforcement; (5-7), Client Irrelevant Information; (6-9), Client Responds Correctly were found to be significantly different at the .01 level. Category (7-10) was found to be significantly different at the .05 level of confidence.
4. When the rank order of the eight similar categories of the two systems were compared, a perfect positive correlation was attained as the ranking of both systems were identical.

Recommended Areas for Further Study

1. Possible incorporation of a category pertaining to Silence within the Boone and Prescott System.
2. Possible simplification of the scoring procedure used by Boone and Prescott.

3. Possible modification of the ABC System to determine the consequences of eliminating Category 1 which was difficult to identify, therefore, infrequently used.
4. Possible incorporation of a category or categories pertaining to client self-evaluation within the ABC System.

APPENDIX I

RECORDING FORM

RECORDING FORM

BOONE AND PRESCOTT SYSTEM

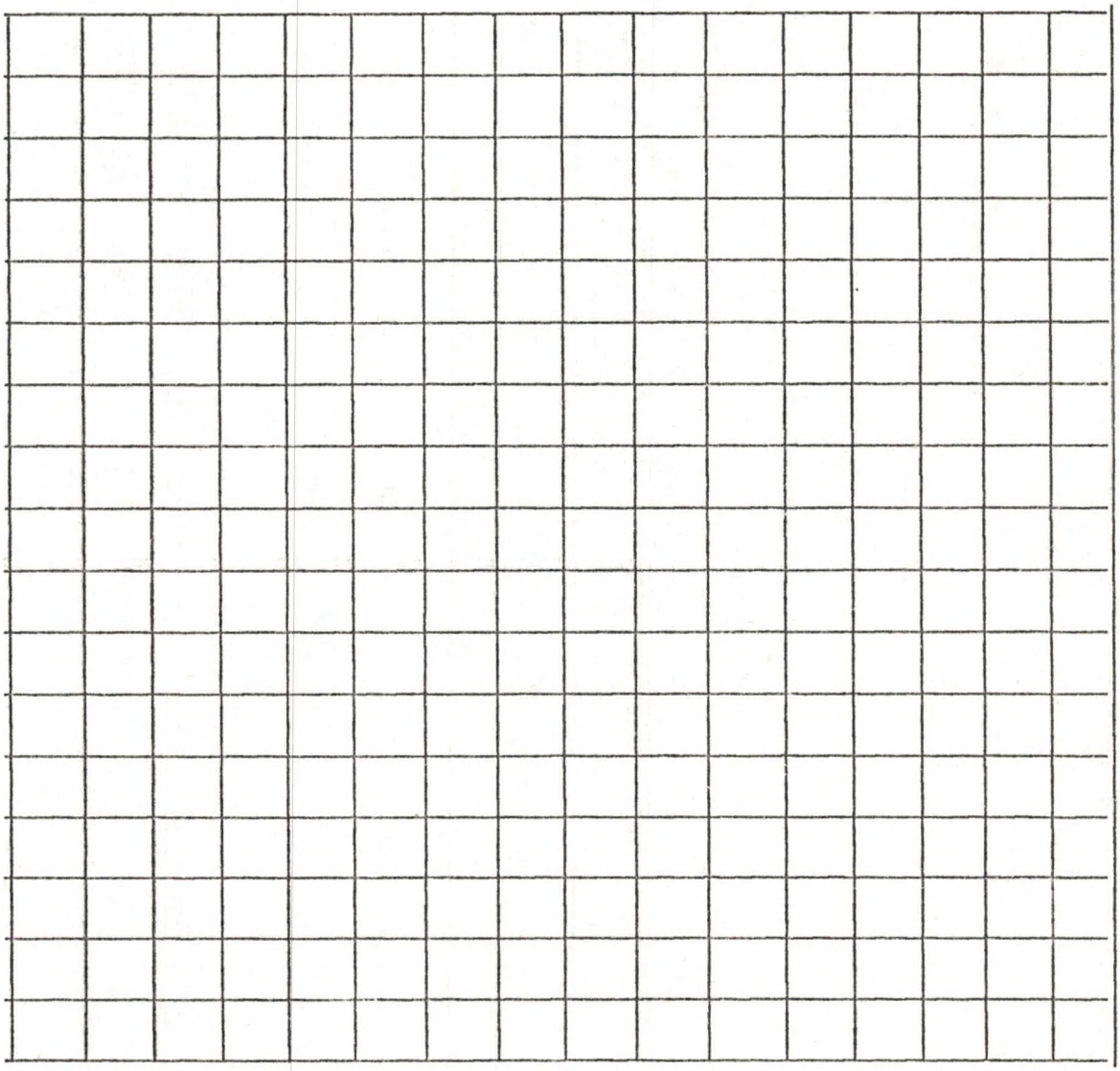
Categories	Total
1. Explain	
2. Model	
3. Good	
4. Bad	
5. Social	
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
6. Correct	
7. Incorrect	
8. Social	
9. Good Self	
10. Bad Self	

APPENDIX II

MODIFIED RECORDING FORM

MODIFIED RECORDING FORM

BOONE AND PRESCOTT SYSTEM



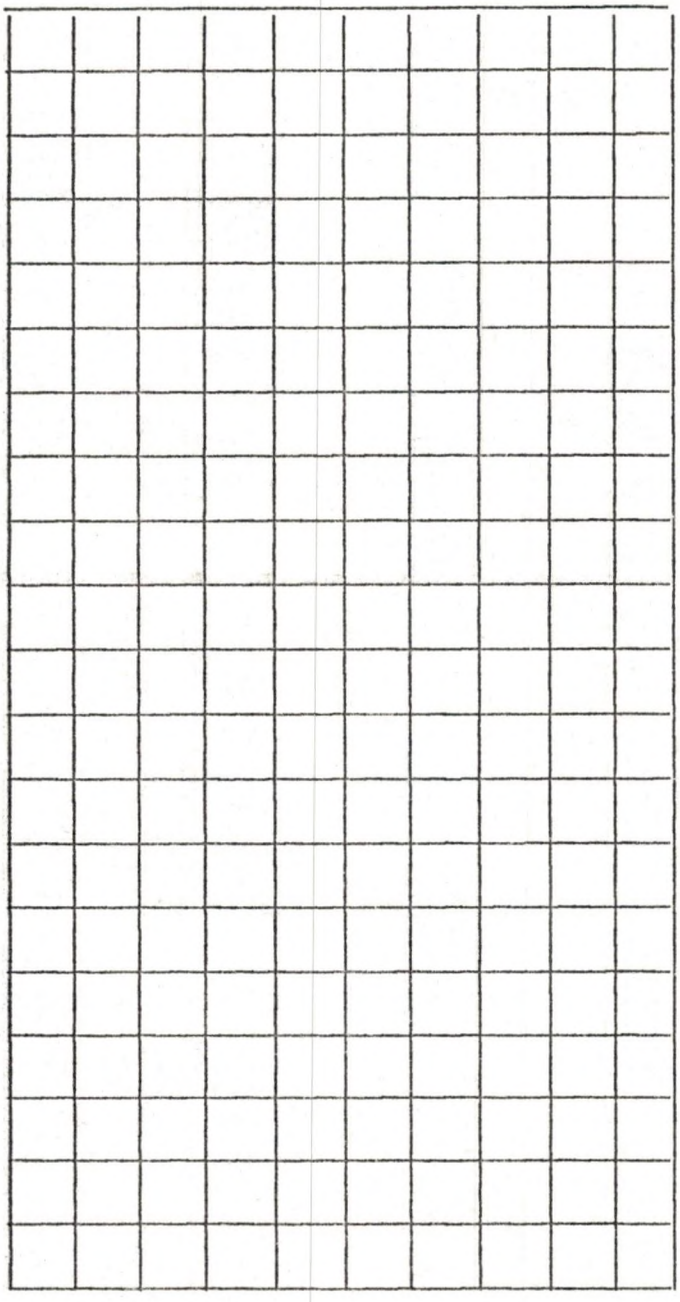
Clinician _____ Client _____ Date _____

APPENDIX III

RAW DATA COLLECTION SHEET

RAW DATA COLLECTION SHEET

ABC SYSTEM



Clinician _____

Client _____

Date _____

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