ED 098 752 EC 070 473

AUTHOR Schubert, George W.; Glick, Audrey M.
TITLE A Comparison of Two Methods of Recording and Analyzing Student Clinician-Client Interaction: ABC System and the "Boone" System.
PUB DATE Oct 73
NOTE 21p.; Paper presented at the Annual National Convention of the American Speech and Hearing Association, Detroit, Michigan, October 1973

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Behavior Rating Scales; Evaluation Methods; Exceptional Child Research; Language Instruction; *Self Evaluation; Speech Handicapped; *Speech Therapists; Speech Therapy
IDENTIFIERS ABC System; Boone and Prescott Ten Category System

ABSTRACT

The research study (described in a paper presented at the 1973 American Speech and Hearing Association Convention) was designed to compare information obtained from the use of the ABC and the Boone/Prescott Systems, two different procedures for recording and analyzing speech clinician-client interaction. Videotapes were made of eight University of North Dakota student speech clinicians involved in articulation and language therapy with 4-to-6-year-old clients. Because both systems did not contain a time factor, it was difficult to establish whether or not the two systems would provide the clinician with similar information. Greater ease was noted in recording within the Boone/Prescott system. The two systems yielded approximately the same information when the therapy situation was basically stimulus, response, reinforcement, with a minimum of irrelevant behavior; however, the ABC System gave more pertinent information when the session was poorly planned and carried out. Both systems provided objective information which could be useful in changing clinician behavior. (LH)

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

by

GEORGE W. SCHUBERT, PH.D.
Associate Professor of Speech Pathology

and

AUDREY M. GLICK, B.S.
Graduate Teaching Assistant

University of North Dakota
Grand Forks, North Dakota

Paper Presented at the Annual National Convention
American Speech and Hearing Association
Detroit, Michigan

October, 1973

INTRODUCTION

In 1970, Boone, and Prescott, at the University of Denver, developed an analysis system of self-evaluation for the purpose of improving clinical skills. Based on an operant stimulus response paradigm, Boone and Prescott's Ten Category 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 categories 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 places a mark (-) which corresponds to the particular behavior occurring at that time.

The ABC System was devised at the University of Washington in 1971 by Schubert and Miner. This system consists of twelve categories: eight categories pertaining to clinician behavior, three categories pertaining to client behavior and one joint category, Silence. Recording of data, using the ABC System is done at three second intervals. Each number corresponds to the specific interaction which occurs during the three second interval immediately preceding the recording. The ABC System is shown in Table 2. Like the Boone and Prescott System, the ABC System enables the clinician and/or supervisor to examine the therapy process in an objective manner.

TABLE 1

BOONE AND PRESCOTT TEN CATEGORY SYSTEM

	Category	Definition
Clinician Behavior	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 gives a verbal or non-verbal disapproval.
	5. NEUTRAL-SOCIAL	Clinician engages in behavior which is not therapy goal oriented.
Client Behavior	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.

TABLE 2

ANALYSIS OF BEHAVIOR OF CLINICIANS (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. AUDITORY AND/OR VISUAL NEGATIVE REINFORCEMENT OF CLIENT'S INCORRECT RESPONSE	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 for 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

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

The eight similar categories are identified by digit-dash-digit. For example, (1-2) identifies Explain and Demonstrates. Category 1 within the Boone and Prescott System are similar to Category 2 within the ABC System. Categories (2-3) identifies Model and Stimulation, in which Category 2 on the Boone and Prescott System and Category 3 on the ABC System are similar. The first digit refers to the Boone and Prescott System while the last digit refers to the ABC System. The similar systems are shown in Table 3.

PURPOSE AND QUESTIONS

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

TABLE 3

EIGHT 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	AUDITORY AND/OR VISUAL PUNISHMENT OF CLIENT'S INCORRECT SOUND
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

The study was designed to answer the following questions:

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

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

PROCEDURE

Subjects

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

Data Collection

Each clinician was videotaped for a random consecutive ten minutes of each of three forty-minute therapy sessions. No recording of behavior was done during the initial or final five minutes of any session. Each ten-minute sample was analyzed using both objective systems of recording clinician-client interaction.

The recording of behavior of eight clinicians, three times each for ten minutes resulted in a total of 240 minutes of recorded clinician-client behaviors. These behaviors were observed and categorized according to the procedures of both methods under consideration.

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, then calculating the percentage of agreement. The initial reliability for the Boone and Prescott system was 97% while reliability midway was 96%. The initial and

midpoint reliability for the ABC System was 95%. Four different tapes were randomly selected and used for the four reliability calculations.

Intra-reliability was established with an individual who had considerable experience using both scoring systems. The percentage of agreement for the Boone and Prescott System was 96%. The percentage reached for the ABC System was 97%.

RESULTS

Question 1: Is there a significant difference between the total number of observations obtained from each system when comparing only the eight categories which are similar?

When the eight similar categories on 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. Analysis using a Chi Square procedure yielded a significant difference at the .01 level of confidence. The observed and expected frequencies for the Boone and Prescott System and the ABC System are shown in Table 4.

When all categories from both systems were observed, it was seen that the difference in the total number of behaviors recorded was very small. The entire Boone and Prescott System revealed 4891 observed behaviors while the entire ABC System revealed 4800. Frequency of occurrence and percentage breakdown by categories for the entire Boone and Prescott System and the ABC System are shown in Table 5. These results showed that some of the dissimilar categories proved important

in terms of frequency of occurrence of behaviors. In the Boone and Prescott System, Category 9 (Good Self-Evaluative) occurred 76 times, or 1.6% or the total behaviors while Category 10 (Bad Self-Evaluative) occurred 16 times or .3% of the total behaviors.

TABLE 4

OBSERVED AND EXPECTED FREQUENCIES OF THE BOONE AND PRESCOTT SYSTEM AND THE ABC SYSTEM USING CHI SQUARE

Category	Boone and Prescott	ABC	Totals
		Observed Frequencies	
(1-2)	132	149	281
(2-3)	1379	1406	2785
(3-4)	740	598	1338
(4-5)	112	108	220
(5-7)	529	423	952
(6-9)	1035	921	1956
(7-10)	270	224	494
(8-11)	602	596	1198
	4799	4425	9924
		Expected Frequencies	
(1-2)	146.2	134.8	281
(2-3)	1449.0	1336.0	2785
(3-4)	696.1	641.9	1338
(4-5)	114.5	105.5	220
(5-7)	495.3	456.7	952
(6-9)	1017.7	938.3	1956
(7-10)	257.0	237.0	494
(8-11)	623.3	574.7	1198
	4799.1	4424.9	9924

When using the entire ABC System, the dissimilar category that occurred most frequently was Category 12, Silence. This behavior was observed 299 times or 6.2% of the total behaviors. Category 3, Using Authority or Demonstrating Disapproval, occurred 72 times or 1.5% of the

total behaviors. When this behavior (Using Authority) occurred while using the Boone and Prescott System, it was reported in Category 5. The use of Categories 1 and 6, when recording behaviors using the ABC System, were almost nonexistent.

TABLE 5

FREQUENCY OF OCCURRENCE AND PERCENTAGES FOR
THE ENTIRE BOONE SYSTEM (10 CATEGORIES)
AND THE ENTIRE ABC SYSTEM
(12 CATEGORIES)

Boone and Prescott System			ABC System		
Category	Frequency	Percentage	Category	Frequency	Percentage
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
		100	11	596	12.4
			12	299	6.2
					100

Question 2: Is there a significant difference between the total number of observations obtained from each of the eight categories of the Boone and Prescott System when compared to the eight similar categories of the ABC System?

Table 6 shows the value reached when statistical analysis was performed on each of the eight similar categories. Using Chi Square procedure, a significant difference in frequency of occurence was found in the following categories at the .01 level of confidence: Category (3-4), Positive Reinforcement; Category (5-7), Client Relating Irrelevant Information; Category (6-9), Client Responds Correctly. At the .05 level of confidence, Category (7-10), Client Resp nds Incorrectly, was found to be significant.

TABLE 6

CHI SQUARE VALUES FOR SIMILAR CATEGORIES

Category	Value	Significance Level	System with Highest Frequency of Occurrence
(1-2)	1.03		ABC
(2-3)	.2616		ABC
(3-4)	15.07	.01	Boone and Prescott
(4-5)	.07		Boone and Prescott
(5-7)	11.80	.01	Boone and Prescott
(6-9)	6.64	.01	Boone and Prescott
(7-10)	4.28	.05	Boone and Prescott
(8-11)	.03		Boone and Prescott

As seen in Table 6, the ABC System yielded the highest frequency of occurrence in Category (1-2) and (2-3), while the Boone and Prescott System yielded the highest frequency of occurrence in the remaining six similar categories. Therefore, wherever a significant difference existed, Categories (3-4), (5-7), (6-9), and (7-10), the Boone and Prescott System always had the highest frequency of occurrence for the similar categories.

Table 7 shows the frequency and percentages calculated for the recorded behaviors of the eight similar categories of the Boone and Prescott System and the ABC System.

TABLE 7

FREQUENCIES AND PERCENTAGES FOR SIMILAR CATEGORIES IN THE BOONE AND PRESCOTT SYSTEM AND THE ABC SYSTEM

Category	Boone and Prescott Frequency	ABC Frequency	Boone and Prescott Percentage	ABC Percentage
(1-2)	132	149	2.75	3.37
(2-3)	1379	1406	28.74	31.78
(3-4)	740	598	15.42	13.51[a]
(4-5)	112	108	2.33	2.44
(5-7)	529	423	11.02	9.56[a]
(6-9)	1035	921	21.57	20.81[a]
(7-10)	270	224	5.63	5.06[b]
(8-11)	602	596	12.54	13.47
	4799	4425	100	100

[a]significant at .01 level of confidence.
[b]significant at .05 level of confidence.

Question 3: 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 occurrence per category in Table 8.

TABLE 8

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

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

When the entire Boone and Prescott System (10 categories) was ranked according to frequency of occurrence of categories, Categories 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%) than Category 10, Bad Self-Evaluative (.3%).

TABLE 9

RANK ORDER OF CATEGORIES WITHIN BOONE AND PRESCOTT SYSTEM

Category	Category Name	Frequency	Rank Using 10 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 occurrence of categories. The entire system (twelve categories) is ranked as are the eight similar categories.

TABLE 10

RANK ORDER OF CATEGORIES WITHIN ABC SYSTEM

Category	Category Name	Frequency	Rank Using 12 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	0	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 categories.

SUMMARY AND CONCLUSIONS

A significant difference was found when the total number of observations from the eight similar categories were compared. Using this comparison, the Boone and Prescott System produced a total of 4799 recorded behaviors while the ABC System totaled 4425 recorded behaviors. However, the entire Boone and Prescott System (10 categories) yielded 4891 behaviors while the entire ABC System yielded 4800 behaviors.

When the total number of behaviors from similar categories were compared, a significant difference was found in Category (3-4), Positive Reinforcement; Category (5-7), Client Irrelevant Information; Category (6-9), Client Responds Correctly; and Category (7-10), Client Responds Incorrectly.

The rank order of the eight similar categories yielded a perfect positive correlation as the rank order of categories of both systems was identical.

Discussion

With the information collected, the researchers found it difficult to establish whether or not the two systems would provide the clinician with similar 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. The Boone and Prescott System accounts for behaviors as they occur without regard to a time factor.

The recording of behaviors within the Boone and Prescott System was done with greater ease than was the ABC System. This was attributed to recording behaviors as they occurred and not having to contend with a timed interval.

It appeared to the researchers that the two systems yielded approximately the same information when the therapy situation was basically stimulus, response, reinforcement, with a minimum of irrelevant behavior. However, if there was a lengthy occurrence of a single particular behavior, the exact number of seconds would be tallied using the ABC System, while it would be given one tally using the Boone and Prescott System. An example of this was evident in collection of data. During language therapy for a particular client, the 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 responded. Here the ABC System gave a much clearer indication of the time spent on a given category.

However, this type of incidence may be an exception rather than a rule. It was apparent that the Boone and Prescott System and the ABC System were very similar in providing useful information during a "typical" therapy session, however when the session was poorly planned and carried out, the ABC System gave more pertinent information in terms of amount of time spent on specific behaviors.

Both the Boone and Prescott System and the ABC System can provide the clinician and 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.

REFERENCES

Anderson, J. L. Status of college and university programs of practicum in the schools. Asha, XV, 60-65, February, 1973.

Black, M.; Miller, A.E.; Anderson, J.L.; and Coates, N.H. Supervision of speech and hearing programs. Journal of Speech and Hearing Disorders, Monotgraph Supplement, VIII, 22-32, June, 1961.

Bloomer, H.H. Professional training in speech correction and clinical audiology. Journal of Speech and Hearing Disorders, XXI, 5-11, March, 1956.

Boone, D.R. A close look at the clinical process. Conference on Supervision of Speech and Hearing Programs in the Schools. Bloomington, Indiana: Indiana University, 1970.

Boone, D.R., and Prescott, T.E. Speech and Hearing Therapy Scoring Manual: A Manual for Learning to Self-Score the Events of Therapy. Partially funded by Bureau of Education of the Handicapped, Office of Education Grant No. OEG-0-70-4758-607, University of Denver, Denver, Colorado, 1971.

Boone, D.R., and Prescott, T.E. Content and sequence analyses of speech an hearing therapy. Asha, XIV, 58-62, February, 1972.

Brooks, R.J., and Hannah, E.P. A tool for clinical supervision. Journal of Speech and Hearing Disorders, XXXI, 383-387, November, 1966.

Darley, F.L. Clinical training for full-time clinical service: A neglected obligation. Asha, XI, 143-148, April, 1969.

Falck, V.T. The role and function of university training programs. Asha, XIV, 307-310, June, 1972.

Flanders, N.A. Analyzing Teaching Behavior. Reading, Massachusetts: Addison-Wesley Publishing Company, 1970.

Halfond, M.M. Clinical supervision - stepchild in training. Asha, VI, 441-444, November, 1964.

Irwin, R.B.; Van Riper, C.; Breakey, M.R.; and Fitzsimmons, R. Professional standards and training. Journal of Speech and Hearing Disorders, Monograph Supplement, VIII, 93-104, June, 1961.

Irwin, R.B., and Nichles, A.A. The use of audiovisual films in supervised observation. Asha, XII, 363-367, August, 1970.

Kunze, L.H. Program for training in behavioral observation, in A Symposium: Improving lirical ractice. Edited by A. Miner. Asha, IX, 473-476, December, 1967.

Laird, S. An investigation of the length of observation necessary to obtain a representative sample of clinician-client interaction. Unpublished M.S. thesis, University of North Dakota, 1973.

Matthews, J. Essentials of an acceptable program of training for speech pathologists and audiologists. Asha, VIII, 231-234, June, 1966.

Miner, A. Standards for quality supervision of clinical practicum, in A Symposium: Improving clinical practice. Edited by A. Miner. Asha, IX, 473-476, December, 1967.

Olsen, B.D. Comparisons of sequential interaction patterns in therapy of experienced and inexperienced clinicians in the parameters of articulation, delayed language, prosody, and voice disorders. Unpublished doctoral dissertation, University of Denver. 1972.

Powers, M. H. What makes an effective public school speech therapist? Journal of Speech and Hearing Disorders, XXI, 461-467, December, 1956.

Prather, E. An approach to clinical supervision, in A symposium: Improving clinical practice. Edited by A. Miner. Asha, IX, 472-473, December, 1967.

Prescott, T.E. The Development of a Methodology for Describing Speech Therapy. Unpublished doctoral dissertation: Denver, Colorado, University of Denver, 1970.

Prescott, T.E., and Tessaro, P.A. Method for describing clinical interactions with aurally handicapped children. Paper presented at the American Speech and Hearing Convention, San Francisco, California, November, 1972.

Pronovost, W.L.; Wells, C.G.; Gray, D.S.; and Sommers, R.K. Research: Current status and needs. Journal of Speech and Hearing Disorders, Monograph Supplement, VIII, 114-123, June, 1961.

Rees, M., and Smith, G. Supervised school experience for student clinicians. Asha, IX, 251-256, July, 1967.

Schubert, G.W. Evaluation of clinical practicum in speech and hearing pathology. North Dakota Speech and Hearing Journal, 1-12, December, 1968.

Schubert, G.W., and Miner, A. Modification of the Flanders' interaction analysis categories for observation in speech therapy. Paper presented at the American Speech and Hearing Convention, Chicago, Illinois, November, 1971.

Schubert, G.W.; Miner, Adah; and Prather, E.A. A comparison of student clinicians' behaviors as measured by the analysis of behaviors of clinicians (ABC) system. Paper presented at the American Speech and Hearing Convention, San Francisco, California, November, 1972.

Schubert, G.W. A comparison of student clinicians' behaviors as measured by the analysis of behaviors of clinicians (ABC) system. Unpublished doctoral dissertation: University of Washington, 1972.

Schmidt, J. Evaluating student's performance in clinical practicum. North Dakota Speech and Hearing Journal, 15, 40-59, December, 1972.

Seigel, S. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, Inc., 1956.

Stace, A.C., and Drexler, A.B. Special training for supervisors of student clinicians: What private speech and hearing centers think about training their supervisors. Asha, XI, 318-320, July, 1969.

Van Riper, C. Supervision of clinical practice. Asha, VII, 75-77, March, 1965.

Ward, L.M., and Webster, E.J. The training of clinical personnel: II. A concept of clinical preparation. Asha, VII, 103-106, April, 1965.