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A survey of carryover practices of public school clinicians in Oregon

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Clinicians report that carryover management is one of the most

difficult and time consuming problems they face (Johnson, 1972) yet the

literature offers little data to assist clinicians in determining what

methodologies should be used and which are effective in facilitating

carryover. The purpose of this investigation was to determine the type

of methodologies utilized by public school clinicians in Oregon to

facilitate carryover with clients originally diagnosed as having articulation disorders. A secondary question dealt with the perceived effectiveness of these methodologies.

A description of current practices and trends in articulation management programs was derived from answers to a questionnaire sent to 200 public school clinicians in Oregon. One hundred and twenty-six of the 159 questionnaires returned were used in the tabulation of results.

Clinicians in Oregon participating in this study employ a variety of methodologies in their carryover programs. Four management techniques were reported used by 70 per cent or more of the respondents to this survey: client self-evaluation; client completion of homework assignments; client works with individuals other than the clinician; and, client practices until responses are automatic. The four most effective management techniques were: client self-evaluation; client practices until responses are automatic; following a structured behavior modification program; and, client works with individuals other than the clinician. The individuals most often included in management were classroom teachers and the client's parents. The most effective individuals, however, were the client's parents and speech aides. Clinician developed carryover programs were reported to be the most often used as well as the most effective material or equipment. Discrepancies in data due to questionnaire design should be studied further.

A SURVEY OF CARRYOVER PRACTICES OF PUBLIC SCHOOL

CLINICIANS IN OREGON

by

JOAN MARIE CRANMER POLSON
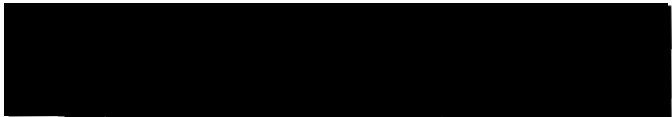
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TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

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CHAPTER I

INTRODUCTION AND PURPOSE

Introduction

Speech-language clinicians have traditionally used five skill acquisition steps in articulation remediation. These include: 1) auditory discrimination; 2) sound production in isolation; 3) sound production in words; 4) sound production in phrases and sentences; and, 5) sound production in conversational speech (Berry and Eisenson, 1956; Johnson, Brown, Curtis, Edney and Keaster, 1967; and Van Riper, 1978). Speech-language clinicians may have assumed when they have followed these steps and taught a new behavior to a student, the student subsequently will utilize that new skill in situations outside the teaching setting. If some degree of generalization to novel situations does not occur, the clinician is forced to teach the client each misproduced phoneme in every possible situation in which it might occur. On the other hand, since correct production of the sound in novel situations is the goal of management, any methods of promoting that generalization likely would benefit the client.

Traditional management procedures facilitate the acquisition of articulatory skills through the stages of sound production in phrases and sentences. Generalization of learned skills to novel situations outside the clinical setting, often described as "carryover," is a phase of management often taken for granted. The process by which

"carryover" occurs is a little studied area in terms of articulation learning. Most speech-language clinicians recognize their responsibilities extend beyond the clinical setting to the outside environment and, although suggestions for methods of facilitating carryover are often cited in the literature (Johnson et al., 1967; Engel, Brandriet, Erickson, Gronhovd and Gunderson, 1966; Wing and Heimgartner, 1973; and Winitz, 1975), little is known about the variables which are critical to the carryover process.

Twenty years ago the majority of cases seen in public school settings involved articulation management (Chapman, Herbert, Avery and Selmar, 1961). Even though the proportion of articulation cases appears to be decreasing (Neal, 1976), the goal of these programs remains the carryover of newly learned articulatory skills to settings outside the clinical environment. Clinicians report that carryover in articulation management is one of the most difficult and time-consuming problems they face (Johnson, 1972). The literature offers little data to assist the clinician in determining what methods should be used and which are effective in facilitating carryover.

Statement of Purpose

This investigation was designed to determine the nature of methodologies utilized by public school clinicians in Oregon to facilitate carryover with clients originally diagnosed as having articulation disorders.

An essential question of this study was: What methodologies do clinicians utilize to promote carryover with their articulation disordered clients?

An additional question was: How effective are the methodologies used perceived to be?

Definition of Terms

For the purposes of this study, the following operational definitions will be utilized.

Carryover: The transfer of acquired skills to situations outside the clinical setting.

Creative dramatics: Stories, plays, poems or skits used in management to provide structured and/or unstructured speaking situations in which the client can use his/her target sound(s).

Stimulus generalization: The phenomenon whereby an individual makes a response that has been elicited by a particular stimulus in the presence of a new stimulus (Mowrer, 1977). For example, the child is first taught to produce the target sound correctly in the presence of the clinician and then to generalize this skill to other speaking situations outside the clinical setting.

Response generalization: This occurs when one stimulus evokes several different responses. For example, the child learns to produce the target phoneme in syllables, and then generalizes this skill to words, phrases and sentences in response to a given stimulus.

CHAPTER II

REVIEW OF THE LITERATURE

Carryover

Twenty years ago articulation disorders composed the majority of
the public school speech clinician's caseload (Chapman et al., 1961).
More recent survey data (DesRoches, 1976; Neal, 1976; and Van Hattum,
1976) show a growing awareness of language and an increased number of
language cases being served. Clinicians no longer have the time they
once did to spend with their articulation disordered clients; and yet,
the ultimate goal of management remains the same. That goal is "carry-
over," the generalization of learned skills to novel situations outside
the clinical setting. Articulation management clients who have
achieved carryover are able to use their target sound in conversational
speech in response to a variety of stimuli outside the clinical setting
(Carrier, 1970; Mowrer, 1971; Wing and Heimgartner, 1973; and Costello
and Bosler, 1976).

Some clinicians view carryover as a separate and final step in
articulation management (Wing and Heimgartner, 1973). With this
approach, the child must be able to produce the target sound in conver-
sational speech before any techniques to help that child use his new
skill in novel situations are incorporated into management sessions.
Other clinicians view carryover as an ongoing process by including car-
ryover techniques in all phases of management. A given methodology for

facilitating carryover may apply equally well to either of these phi-
losophies. For example, one technique suggested as effective in pro-
moting carryover is having the child work with the classroom teacher
(Engel et al., 1966). Clinicians who view carryover as a final step
would have the teacher evaluate or monitor the child's speech at the
conversational level only. Clinicians who promote carryover throughout
their management program, on the other hand, would have the teacher
evaluate or monitor the child's speech at each stage of management.

All steps of articulation intervention programs with the excep-
tion of carryover have been organized, defined and supported by exten-
sive research (Wing and Heimgartner, 1973). Efforts in a management
program are futile if articulatory errors continue to occur in conver-
sational speech away from the clinic (Winitz, 1975). Unfortunately,
few studies have looked specifically at the carryover process or have
compared any of the methods or techniques suggested in the literature.
Suggestions or ideas for carryover techniques, however, are abundant in
the literature.

Methods for Facilitating Carryover

Two approaches to carryover have been suggested by the litera-
ture. One is to provide some speech training in the clinic setting
followed by structured speaking situations where the child is prompted
to articulate the target sound correctly in a variety of speaking envi-
ronments while in the presence of his teachers, peers and parents
(Lillywhite, 1948; Marquardt, 1959; Engel et al., 1966; Carrier, 1970;
Mowrer, 1971; Fudala, 1973; and Wing and Heimgartner, 1973). This
procedure might best be described as planned extraclinical stimulus

generalization.

The other approach is to provide all of the necessary speech training within the speech room so that positive transfer of the taught sound occurs without manipulation of stimuli outside the clinic room. This technique involves specially selected practice materials and structuring of the management procedures within the clinic room (Sutton, 1955; Powers, 1957; Engel et al., 1966; Brookshire, 1967; McReynolds, 1970; and Van Riper, 1978). Either of these strategies for accomplishing carryover may be valid but neither has clearly emerged as the approach of choice.

Individuals in the Child's Environment

Clinicians may enlist the help of teachers, parents, peers, siblings or other individuals in the child's immediate environment to aid in management. The child's use of the target sound in structured situations with individuals other than the clinician is believed to be beneficial in promoting carryover. Clinicians, however, who enlist help from individuals in the client's environment frequently are limited by the availability, willingness or ability of those persons to participate in the program. When the cooperation of outside individuals is secured, their help appears to aid in the carryover process (Marquardt, 1959; Carrier, 1970; Carpenter and Augustine, 1973; Fudala, 1973; and Wing and Heimgartner, 1973).

Most textbooks concerning speech intervention mention the teacher's role in helping the child use the target sound in classroom speaking situations. Mowrer (1971) evaluated classroom teacher effectiveness in a speech correction program in which the teachers were involved

with actual management procedures designed to teach "lisping" children to say /s/ correctly in a variety of speaking situations. The program required that teachers spend about ten minutes daily teaching correct /s/ production to a "lisping" child. The experiment is reported to have placed impractical demands upon the teachers and, due to inconsistencies in the deliveries, the value of the program could not be measured.

Several speech clinicians have suggested that peers can help the child use new sounds correctly when reading or speaking in the classroom or on the playground (Marquardt, 1959; and Engel et al., 1966). Marquardt (1959) based her "speech pals" program on the theory that children learn behaviors more quickly from their peers than from adults. Children with acceptable speech are called "speech pals" and help with the carryover process by providing speech stimulation outside of the clinical setting. In this program a leader-type child, selected by the classroom teacher, accompanies the speech handicapped child to the management session once a week. After an adequate number of sessions, where the helper observes the clinician's techniques and attitudes, the speech pal then spends fifteen minutes a day helping the child practice what he has learned in speech class. The primary role of the speech pal is that of moral support, so the speech handicapped child is not made to feel "different" because he comes to speech (Marquardt, 1959).

Engel et al. (1966) has suggested a "carryover friend," similar to Marquardt's "speech pal," could be seated near the child who needs speech monitoring. At specific times during the day the friend could depress a clicker to signal correct sound production. The number of clicks could be totaled at the end of the day and used as points for a class party. Research has not been done on this method to demonstrate

its effectiveness.

In addition to aid from teachers and peers, parents can help facilitate carryover. Sometimes, they work directly with the child on his assignments. Even if they are unable to work with the child, their interest in what he/she is working on and how the child is doing may reinforce efforts to improve. Parents, and specifically mothers, have been advocated as aides in the carryover process by numerous authors (Lillywhite, 1948; Tufts and Holliday, 1959; Sommers, Furlong, Rhodes, Fichter, Bowser, Copetas and Saunders, 1964; Engel et al., 1966; Carrier, 1970; Mowrer, 1971; and Wing and Heimgartner, 1973).

Many parents need specific instructions about how to respond to their child's speech. Some parents correct their child's speech so frequently that he/she becomes either insensitive or hypersensitive to reactions at home (Engel et al., 1966). However, if guidelines for parental involvement are provided a home program may expand the management program beyond the clinic room, a concept viewed as an important dimension of articulation carryover by Van Riper (1978). Home programs completed by parents may be a means of attaining carryover without extended clinical management (Wing and Heimgartner, 1973). Carrier (1970) utilized parental help in a novel manner by specially training mothers to carry out a home program of articulation management prior to any clinical intervention. He found this method reduced the manpower needed to complete an average articulation management program and may have had the additional benefit of promoting carryover.

Sommers (1962) looked at the effectiveness of training mothers of children with functional misarticulations. Mothers were involved in the management stage rather than specifically in carryover. Groups of

subjects whose mothers were trained made significantly greater progress in improving articulation skills than subjects whose mothers were not trained. If mothers trained in management were able to improve the articulatory skills of their children, then it would seem logical to assume that mothers trained in carryover techniques would increase the amount of stimulus generalization of the target sound made by their children. A similar study on the effects of maternal attitudes on improvement in articulation management found that children of mothers trained to assist in speech correction improved significantly compared with children of mothers not trained (Sommers et al., 1964). The children were tested two months post-management so it appears some degree of carryover was measured.

Parent education programs may help parents who are assisting their articulation disordered children with speech intervention. Researchers have suggested that if parents had pertinent facts about speech disorders and could eliminate their anxiety and guilt feelings, those parents then could help their children with their speech (McIntyre and McWilliams, 1959; McWilliams, 1959; and Webster, 1966). If parents also are educated about the process of articulation acquisition, they may be better able to follow the progress their children make and formulate more realistic expectations of their children's speech.

Management Techniques

Not all clinicians involve the client's associates as a means of promoting carryover. Another philosophy of carryover methodology relies on a variety of management techniques to be used in the clinical

setting (Sutton, 1955; Powers, 1977; Engel et al., 1966; Brookshire, 1967; McReynolds, 1970; and Van Riper, 1978).

One method of promoting carryover is for the child to produce habituated sounds in as many different contexts as possible, in varied social and emotional settings. One means of achieving this goal without leaving the clinic room is through creative dramatics. This method is a means of practicing newly learned phonemes in natural language situations (Bush, 1978). Creative dramatics can reduce tension and promote enjoyment and ease of speaking because the clients learn to feel free to talk without embarrassment in this medium (McIntyre and McWilliams, 1959; Hayes, 1976; and Via, 1976).

Sutton (1955) believes one of the most practical and rewarding methods of reinforcing a pupil's progress is that of integrating speech management with the student's language arts program. The advantages of this approach are that it: 1) affords a vehicle by which the principles of speech correction can be applied; 2) provides a link between classroom material and speech management material; 3) provides an opportunity for the child to assume added responsibility and initiative in the carryover of speech management outside the speech room; and, 4) establishes criteria for judging the stability and effectiveness of techniques and materials involving the academic, social and emotional status of the child (Sutton, 1955). Speech correction does not occur in a vacuum, and the more frequently the management program is tied to the daily classwork of the child, the better the prognosis for successful carryover (Sutton, 1955).

Mowrer (1971) and Brookshire (1967) advocate following a structured behavior modification program to promote carryover. These

behavior modification programs are based on the principles of operant conditioning, the process whereby consequences or consequent events occur relative to a response so that the response is controlled. The result of operant conditioning is an increment or a decrement in the rate of the responses, subject to the contingencies. When applying operant conditioning techniques to the speech patterns of a client, the desired behavior of correct phoneme production should increase as a consequence of the management program. The nature of the management program itself is said to facilitate carryover due to specific program-ming of all components including planned reinforcement schedules and gradual altering of behavior toward the desired goal of correct articu-lation.

One must not forget the client himself in the rush to devise means of stimulating carryover. Many clients approach management passively as if they needed only to make an appearance. They sit down and wait for the clinician to do something for or to them. Some clinicians respond to this attitude by assuming all responsibility for changing the client's behavior without placing responsibility with the client. The client should understand that management is a procedure by which he changes his own behavior with the clinician's help. Responsibility for change is placed with the client and redefined as often as needed. A sense of client responsibility can be strengthened through client devised homework assignments (Engel et al., 1966; and Casteel, 1979). The client's desire to improve his speech is a powerful force in obtaining carryover. This desire should be encouraged and developed as soon as management begins.

Awareness of his speech is one way for the client to develop a

desire to change. This awareness may be acquired through auditory training exercises. The client must not only learn to discriminate between his responses and those of the clinician, but also must realize the differences he perceives constitute a real or potential problem. It is only then that he can accept responsibility for his speech.

Materials and/or Equipment

Commercial carryover programs may include operant conditioning principles in their format. Gerber's (1973) program for habituating correct articulation patterns required that the client produce nonsense syllables and words in all of the combinations and conditions of rapid connected speech at several levels of difficulty. Because of the strong bond between meaning and the habitual pattern of the error sound, Gerber (1973) does not introduce meaningful units of speech until normal production and self-monitoring have been achieved at each level.

Other materials said to facilitate carryover are games (Van Riper and Irwin, 1958). Games may be a valuable means of creating excitement, absorbing attention, and facilitating less deliberate careful drill-like speaking situations (Engel et al., 1966). Games are also an effective means of involving family members and friends in the management process by having them play the games with the client.

Some clinicians may choose to facilitate carryover by involving the child's associates outside the clinic to monitor his speech. Others may choose to use specially designed programs or methods without leaving the clinic room. Others still may choose to use a combination of these practices. No matter which philosophy is adopted, several important principles of positive transfer of training influence the

success of the procedures.

Transfer of Training

Basically, four major factors have been found to influence posi-
tive transfer of training or carryover. They are: 1) stimulus simi-
larity, 2) amount of training, 3) reinforcement variability and 4)
punishment (Mowrer, 1977). The more similar the stimuli in the train-
ing and test activities, the greater the positive transfer, if the
response remains constant (Osgood, 1949). The child is more likely to
generalize learned skills to situations outside the clinic room if
these environments are similar to clinical activities. A second fac-
tor, the amount of training, also alters the degree of transfer. The
more training provided on the original task the greater the positive
transfer, up to a certain point beyond which positive transfer either
ceases or in some cases begins to decrease (Mowrer, 1971). Children
with disordered articulation who are continually reminded they say
certain sounds wrong are more likely to withdraw and show no improve-
ment as a result of the comments. It is currently not known how much
training is required to achieve carryover at given stages of speech
acquisition. The third factor influencing transfer of training is the
reinforcement schedule. When correct responses are reinforced immedi-
ately, the likelihood of positive transfer is greater than if those
responses are not reinforced (Mowrer, 1971). Furthermore, responses
acquired under conditions of intermittent reward are more likely to
transfer positively than are those acquired under conditions of constant
reward (Mowrer, 1971). For example, when a rich reinforcement schedule
is suddenly withdrawn, as when a child leaves the clinic room, the

child's behavior extinguishes much more rapidly than when the rein-
forcement schedule is leaner. Punishment, the fourth variable which
influences carryover, may lead to a greater degree of transfer of
training. A tendency to respond increases when a desired behavior is
reinforced. A tendency not to respond with an undesirable response
increases when the undesirable response is punished (Mowrer, 1971). If
the child is producing the target sound incorrectly, the use of punish-
ment may result in an increase of correct sound production through a
decrease in incorrect sound production. Many clinicians are unsure of
what action to take following a child's incorrect response. The data
regarding the influence of punishment are insufficient to support any
conclusions.

There has been, to date, a lack of information dealing with
clinical practices currently used in the public schools to promote
carryover. The literature suggests a variety of methods clinicians in
the public schools might use but there are few data on what clinicians
actually use; nor, are there data showing which of the methods they
consider to be effective in promoting carryover.

CHAPTER III

METHODS AND PROCEDURES

Methods

Subjects

Subjects for this survey included 126 public school speech-language clinicians in Oregon.

Criteria for participation in the study were:

1. Listing in the 1979 American Speech, Language and Hearing Association (ASHA) and/or Oregon Speech and Hearing Association (OSHA) directories,

2. A public school caseload including clients with disordered articulation skills, and

3. More than nine months' experience in a public school setting as a speech-language pathologist.

Of the 125 clinicians who reported their level of training, 112 (90 per cent) held a master's degree, 9 (7 per cent) have completed a fifth year of training and 4 (3 per cent) held a bachelor's degree. All of the clinicians reported speech pathology as their area of training. The average length of time that the clinicians have worked in the public schools is 8.3 years with a range of 1 year to 28 years. Their average caseload size was 45 students per week and they served an average of 3.5 schools (Appendix A).

Instrumentation

A questionnaire (Appendix B) was designed by this examiner to yield information about carryover practices of public school clinicians.

Information on the construction of the questionnaire was drawn from Moser and Kalton (1971) and Dillman (1978). Material in the questionnaire was based on a review of the literature dealing with techniques for facilitating carryover in speech/language programs.

Five categories of data composed the questionnaire: demographic data, management practices, use of carryover methodologies, effectiveness of carryover methodologies and related information. The first category, demographic data, consisted of seven open ended questions designed to provide information germane to the description of clinicians responding to the questionnaire. These questions were not numbered.

The second category, management practices, consisted of questions one, six and seven designed to elicit information relative to schedules and emphasis of client contact. The format of question one was forced choice and that of questions six and seven was open ended.

The third category, use of carryover methodologies, consisted of the forced choice portions of questions two, three and four. Each question evaluated one aspect of clinical methodologies. Question two, dealing with carryover techniques, was composed of twelve forced choice items followed by three open ended items. Question three, dealing with people included in carryover, was composed of six forced choice items and two open ended items. Question four, materials and/or equipment used in carryover, was composed of four forced choice items and three open ended items.

The fourth category, effectiveness of carryover methodologies, consisted of the rank order portions of questions two, three and four. Again, each of these questions evaluated one aspect of this category.

Question two, dealing with carryover techniques, asked that clinicians rank order only those items they reported using in carryover. They were asked to assign the most effective methodology in a given category a value of "one," the second most effective method a "two" and so on until all the methods used were assigned a rank value.

Questions three and four followed the same procedures as question two. The only difference between the questions was that question three dealt with individuals included in the carryover program and question four requested data on the effectiveness of materials and equipment used.

A fifth category, related information, included questions five, eight and nine. Question five contained thirteen forced choice items followed by four open ended items requesting data as to what the clinician would add to a carryover program. Questions eight and nine were open ended in nature. Question eight asked the clinician to list major problems in attaining carryover and question nine requested any additional information the clinicians wished to report.

A pilot study completed by ten speech-language pathologists working in the public school system in Corona, California, provided comments which were the basis for changes in the questionnaire format.

Procedures

A questionnaire (Appendix B), a letter of introduction and consent (Appendix C) and a stamped, addressed return envelope were mailed to two hundred speech-language pathologists listed in the ASHA or OSHA directories as working in the public schools. Follow-up postcards (Appendix D) were sent to all clinicians two weeks after the initial

mailing. The postcard served as a reminder to complete and return the questionnaire for those clinicians who had not done so and a thank-you to those who had. Clinicians read and responded to items listed on the questionnaire per instructions included in each question (Appendix B).

Data Coding

Data were transferred from the surveys to grid sheets and recorded according to item and questionnaire number. Data not related to a specific questionnaire item, such as "other" methodologies used, were recorded according to question and questionnaire numbers. Responses to questions eight and nine, problems and additional information, were recorded on index cards according to survey number, the responses from one questionnaire per card.

Analysis of the Data

Demographic Data. Demographic data were analyzed by descriptive statistics with the mean value and the range being reported.

Management Practices. Management practices, questions one, six and seven of the questionnaire, were analyzed in terms of descriptive statistics. The median value of question one, the percentage of management devoted to facilitating carryover, was reported. The data from questions six and seven were reported in mean values.

Use of Carryover Methodologies. Responses to each item were totaled, then converted to percentages and reported as percentage of clinicians utilizing a given methodology in their management programs.

Perceived Effectiveness of the Carryover Methodologies. In that 1) respondents only ranked those items they identified as using and 2) some items were used much more frequently than others, the rank

totals per item on "effectiveness" were based on unequal numbers of
respondents, thereby making comparisons of those totals meaningless.
In consultation with Grove (1980), the following formula was developed
to provide a basis for comparing the total rank values across items.
That conversion formula is:

$$\frac{\text{Number of responses for the most often ranked methodology}}{\text{Number of responses for a specific methodology}} \times \begin{array}{l}\text{Sum total of the ranked values of the specific methodology}\end{array} = \begin{array}{l}\text{Adjusted rank total}\end{array}$$

This formula was applied to estimate the value of rank totals if
all items had been included in the ranking as frequently as the most
frequently ranked item. That is, the size of the ranks given a partic-
ular item were used to estimate the values of the missing rank data for
that item. In this way, without penalizing a given item for lack of
frequent use, relative effectiveness among the items could be estimated.
However, it should be cautioned that inferences based on comparisons
between total item ranks in this way would be more credible for items
with less missing data than with more missing data.

Respondents ranked methodologies reported in the open ended por-
tion of the questions, "other" methodologies used but not listed as a
question item. The rank values were adjusted to exclude these items
prior to transfer of data from the questionnaire to grid sheets. The
resulting data reported the rank order of only the forced choice items
used by the clinicians.

CHAPTER IV

RESULTS AND DISCUSSION

Results

One hundred and fifty-nine of the two hundred questionnaires (80 per cent) were returned. One hundred and twenty-six were used in the final tabulation of results; thirty-three were excluded for a variety of reasons, such as the respondent no longer held a clinical position, did not have a caseload including articulation disordered clients, or the survey was returned more than two months after the initial mailing.

The purpose of this study was to investigate the carryover practices of speech-language clinicians in Oregon's public schools. An essential question was: What methodologies they use to promote carryover for their clients with disordered articulation. An additional question was: How effective are the methodologies used perceived to be?

Methodologies Used

Management Techniques. Examination of the survey data revealed the percentage of clinicians who use the following methods: client self-evaluation (83 per cent); client completion of homework assignments (81 per cent); client works with individuals other than the clinician (79 per cent); client practices until the responses are automatic (71 per cent); client works with the clinician outside the clinic room (63 per cent); distribute reminders in the client's environment

(62 per cent); follow a structured behavior modification program (50 per cent); use auditory discrimination training (50 per cent); include creative dramatics in management (46 per cent); integrate management with the language arts program (29 per cent); client develops his own homework assignments (21 per cent); and, client practices under emotional conditions (12 per cent) (Table I).

Individuals in the Child's Environment. The data also revealed the percentage of clinicians who include non-clinician individuals in management activities: client's parents (94 per cent); classroom teacher (94 per cent); client's peers (60 per cent); speech pals (50 per cent); classroom aides (34 per cent); and, speech aides (16 per cent) (Table II).

Materials and/or Equipment. Data revealed the percentage of clinicians including the following materials or equipment in their program: clinician developed carryover programs (82 per cent); tape recorders (54 per cent); workbooks (53 per cent); and, commercial carryover programs (52 per cent) (Table III).

Effectiveness of Reported Methodologies

Management Techniques. Comparison of adjusted rank totals revealed the relative effectiveness of the methodologies as perceived by the clinicians. The methods used were ranked as follows with "1" representing the most effective method used: client self-evaluation (1); client practices until responses are automatic (2); follow a structured behavior modification program (3); client works with individuals other than the clinician (4); client works with the clinician outside the clinic room (5); use auditory discrimination training (6);

TABLE I

METHODOLOGIES USED IN CARRYOVER AND THEIR PERCEIVED EFFECTIVENESS

	# Clinicians including this method in program	% of total: N=126	# Ranking the method	Perceived effectiveness: adjusted total	Median value of ranks	Mode value of ranks	Range of responses	# Ranking method most effective	% Ranking method most effective	# Ranking method among 3 most effective	% Ranking method among 3 most effective
Follow structured behavior modification program	63	50	59	377.7	3	1	1-12	19	32	33	56
Work with clients outside clinic room	79	63	72	410.4	4	3	1-10	9	12.5	31	43
Distribute reminders in client's environment	78	62	74	456.9	5	5	1-10	7	10	25	34
Use creative dramatics in management program	58	46	53	465	5	3,5	1-12	5	9	21	40
Integrate management with language arts program	36	29	30	530.8	6	6	1-11	2	6	10	33
Use auditory discrimination training of target sound	63	50	56	413	4	4	1-12	6	11	21	38
Have client evaluate himself	105	83	98	274.5	2	1	1-8	34	35	69	70
Have client work with others	99	79	89	381.2	4	4	1-10	8	9	44	49
Have client complete homework assignments	102	81	94	417.5	4	2	1-9	5	5	41	44
Have client develop his homework assignments	27	21	23	573.1	5	8	1-11	1	4	5	22
Practice until responses are automatic	90	71	82	307.2	2.5	1,2	1-11	10	24	52	63
Practice under emotional conditions	15	12	13	603.1	6	6	3-9	-0-	-0-	1	8

TABLE II

USE OF OUTSIDE INDIVIDUALS IN MANAGEMENT AND THEIR PERCEIVED EFFECTIVENESS

Individuals	# Clinicians including individual in their management program	% of total N=126	# Ranking individuals	Perceived effectiveness: adjusted total	Median value of ranks	Mode value of ranks	Range of responses	# Respondents ranking a person as their most effective source of help	% of those ranking that given person
Speech aides	21	16	20	216.6	1.5	1	1-5	10	50
Classroom aides	43	34	40	346.3	3	3	1-5	1	8
Classroom teachers	119	94	114	284.5	2	2	1-5	24	21
Speech pals	63	50	61	303.7	3	3	1-6	17	28
Client's peers	76	60	72	342.8	3	2	1-6	12	17
Client's parents	119	94	114	216.5	2	1	1-6	57	50

TABLE III

USE OF MATERIALS AND/OR EQUIPMENT IN MANAGEMENT AND THEIR PERCEIVED EFFECTIVENESS

Materials and/or Equipment	# Clinicians including material or equipment in their management program	% of total N=126	# Clinicians ranking the material or equipment	Perceived effectiveness: adjusted total	Median value of ranks	Mode value of ranks	Range of responses	# Respondents ranking an item their most effective source of help	% of those ranking that given item
Workbooks	67	53	62	237.7	2.5	3	1-4	7	11
Commercial carryover programs	65	52	61	165.8	2	1	1-4	24	39
Clinician developed programs	103	82	96	127	1	1	1-4	71	74
Tape recorders	68	54	66	184.9	2	2	1-4	13	20

client completion of homework assignments (7); distribute reminders in the client's environment (8); include creative dramatics in management (9); integrate management with the language arts program (10); client develops his own homework assignments (11); and, client practices under emotional conditions (12) Table I).

Individuals in the Client's Environment. The effectiveness of individuals other than the clinician was also evaluated. The effectiveness of non-clinician individuals was rank ordered as follows: client's parents (1); speech aides (2); classroom teachers (3); speech pals (4); client's peers (5); and, classroom aides (6) (Table II).

Materials and/or Equipment. The materials and/or equipment used were ranked as follows: clinician developed carryover programs (1); commercial carryover programs (2); tape recorders (3); and, workbooks (4) (Table III).

Management Practices

The average clinician surveyed schedules clients for articulation management 2.5 times per week for a total of fifty minutes per week. An average of thirteen weeks of management are needed before the client produces the target sound in the clinic setting. Twenty-four and a half weeks, on the average, are spent in management to generalize the sound to settings outside the clinic room (Table IV) with approximately 20 per cent of the management program devoted to carryover.

Discussion

The purpose of this study was to augment existing knowledge of clinical management practices. Specifically, surveys were used to

TABLE IV

MANAGEMENT PRACTICES

	# Clinicians reporting data	Mean value of data	Range of data
Number of times clinician sees client per week	122	2.3 sessions	1-4 sessions
Length of each session	122	25 minutes	5-30 minutes
Amount of time per week each client is seen	122	50 minutes	20-120 minutes
Weeks of management needed until client uses target sound in speech room	105	13 weeks	1-34 weeks
Weeks of management needed until client uses target sound outside speech room	90	24.5 weeks	5-72 weeks

determine what methodologies are being used by public school clinicians in Oregon to promote carryover with articulation disordered clients. A secondary question dealt with the perceived effectiveness of these methods. Clinicians also provided data on clinical management practices and problems encountered with carryover programs.

Demographic Data

The first question of the survey, asking the number of students in the school system, was designed to yield the size of the population from which clinicians drew their caseloads. Wording of this item was such that the resulting data was inconclusive. Sixty-five per cent of the respondents answered this question, reporting that the average

number of students in the school system was 10,000. The range of responses was from 20 to 53,000. A more meaningful question may have been to ask the clinicians "the number of students from which you draw your caseload."

Ninety-eight per cent of the respondents answered the question regarding caseload size. They reported serving an average of 45 students per week with the responses ranging from 12 students per week to 150 students (Appendix A). In the past, speech-language clinicians have managed large numbers of cases, as reported by Steer (1961) who found the mean caseload of 1462 clinicians to be 130 students. Johnson (1972) reported the average caseload size of North Dakota clinicians to be 58 students per year. Four years later DeRoches (1976) surveyed clinicians in a suburban Maryland school system. The average caseload of these clinicians was 80 students per week. Neal (1976) found similar results in a national survey of speech-language clinicians in secondary schools whose average caseload was 72.68 students per week. The trend appears to be toward smaller caseloads but the size may vary from region to region. Two questions not asked in the questionnaire but which may influence caseload sizes are: 1) Is the clinician employed on a part-time or full-time basis; and 2) does the clinician have an aide who handles part of the caseload? A sample with a significant number of part-time clinicians may decrease the average number of students seen per week. Conversely, a sample with a large number of aides serving clients may increase the average number of students served per week.

Ninety-eight per cent of the clinicians reported the number of schools they served. Data ranged from one school to 11 schools served

by a given clinician with the average being 3.5 schools (Appendix A).
Neal (1976) found a slightly lower average of 2.89 schools served per
clinician in his national survey of clinical practices.

Methodologies and Their Effectiveness

Clinical practices in articulation management can be grouped in
several ways, one being to separate those methods used within the clin-
ical setting from those that occur outside the speech room. This
grouping is arbitrary in that many techniques frequently associated
with one setting may be used equally well in another. For example,
creative dramatics is a technique designed to simulate a variety of
speaking situations without leaving the speech room. Creative dramat-
ics also may take the form of skits, plays or poems performed for the
student's classmates.

Methods Used in the Clinic

Twelve clinical methodologies were listed on the questionnaire
with spaces provided for clinicians to note additional methods. Of the
twelve methods, the following six are techniques frequently used within
the confines of the clinic room: self-evaluation, auditory discrimina-
tion training, automatization of responses, creative dramatics, prac-
ticing under emotional conditions and behavior modification.

Auditory Discrimination Training. Auditory discrimination train-
ing was used by 50 per cent of the respondents making it the seventh
most used method (Figure 1). In terms of effectiveness, clinicians
ranked auditory discrimination training as the sixth most effective
technique (Figure 2). Auditory discrimination exercises may teach the

A Use auditory discrimination training

B Have client evaluate himself

C Have client practice until responses are automatic

D Incorporate creative dramatics into the management program

E Have client practice under emotional conditions

F Follow a structured behavior modification program

G Work with the client outside the clinic room

H Have the client complete homework assignments

I Have the client develop his own homework assignments

J Distribute reminders in the client's environment

K Integrate management with the language arts program

L Have the client work with others

Figure 1. Percentage of clinicians who include a given technique in management.

Percentage of clinicians

A Use auditory discrimination training

B Have client evaluate himself

C Have client practice until responses
are automatic

D Incorporate creative dramatics into
the management program

E Have client practice under emotional
conditions

F Follow a structured behavior
modification program

G Work with the client outside the
clinic room

H Have the client complete homework
assignments

I Have the client develop his own
homework assignments

J Distribute reminders in the client's
environment

K Integrate management with the
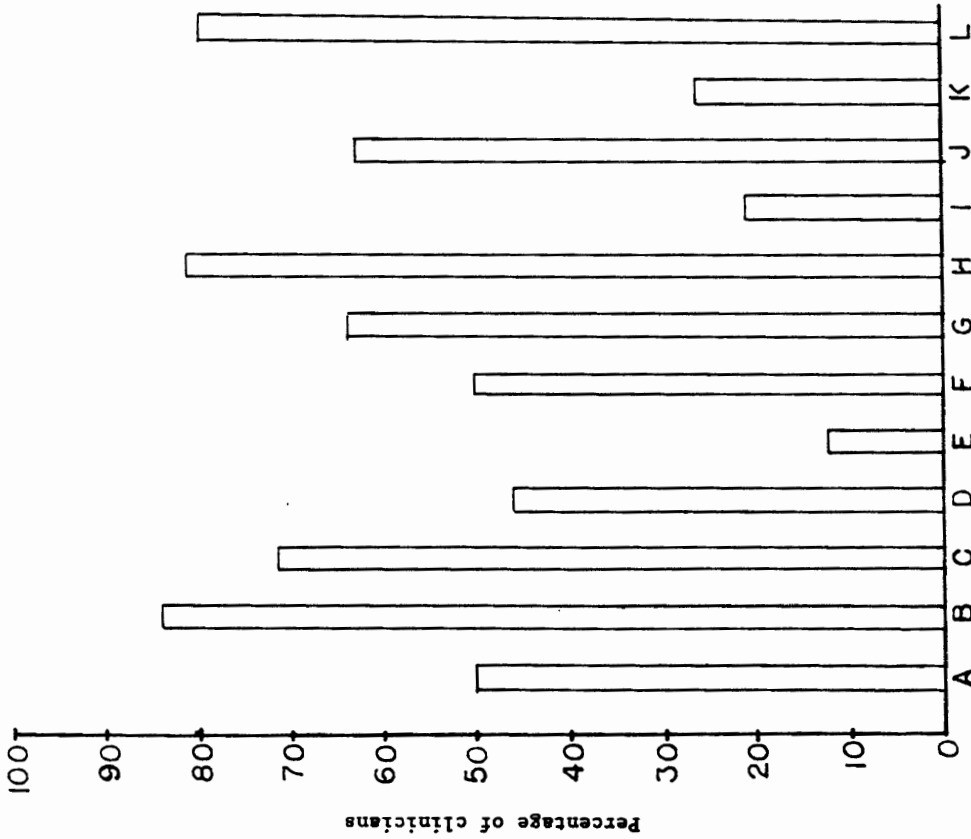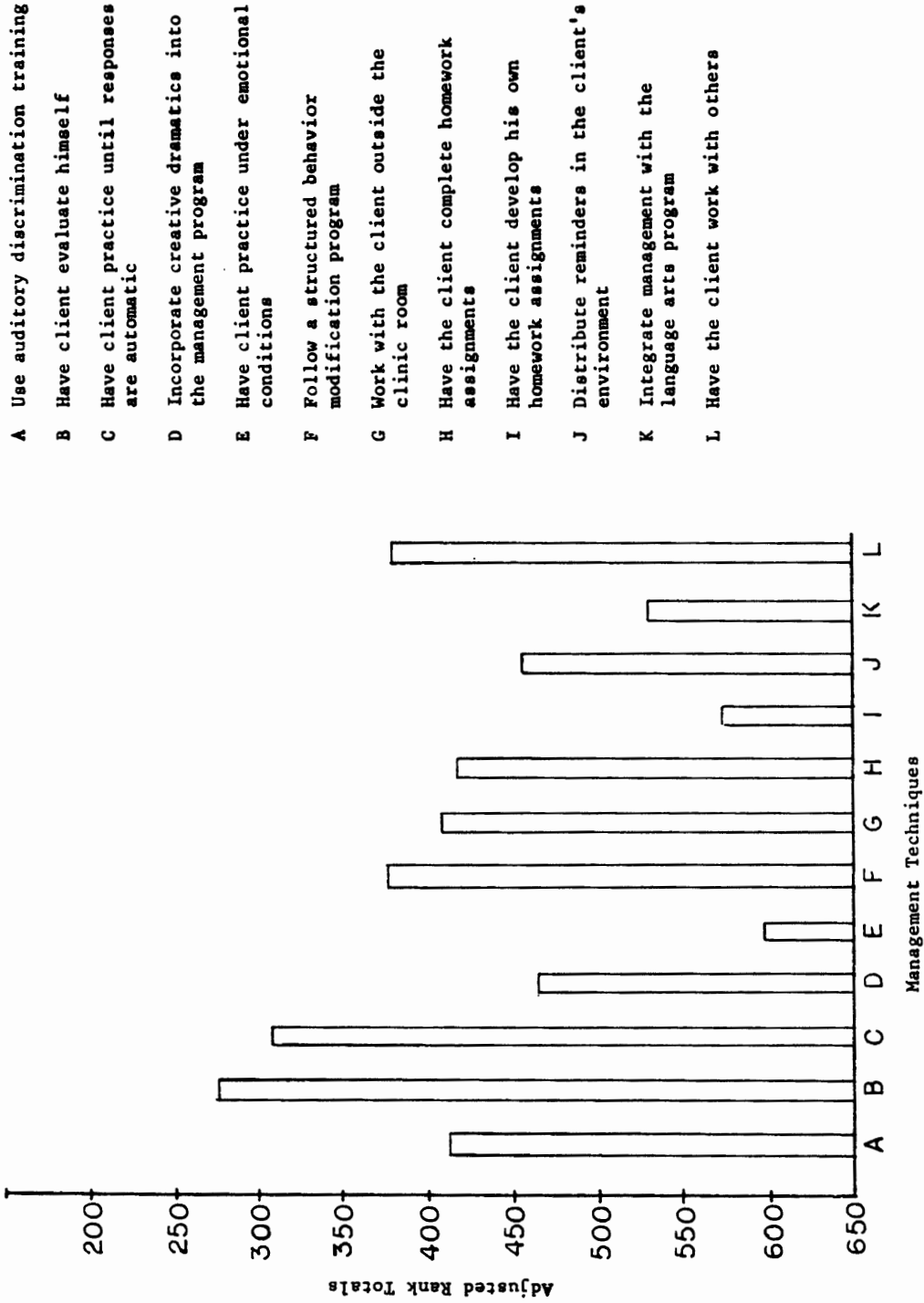language arts program

L Have the client work with others

Figure 2. Effectiveness of management techniques
in promoting carryover.

client not only to discriminate between his responses and those of the clinician, but more importantly for carryover, to discriminate between his correct and incorrect responses. In order for carryover to be effective, the client should monitor his speech for correctness of production in a variety of situations. If he cannot monitor his speech and, hence, is unable to evaluate his productions, it follows that he will not know if he is using the target sound correctly. He could return to old and familiar speech habits yet be unaware that he is doing so.

One would assume that good auditory discrimination skills would form the foundation of any articulation management program, yet 50 per cent of the respondents did not report including this step in their programs. In addition, those who did report using auditory discrimination techniques believed them to be only moderately effective in promoting carryover. Programs which do not include adequate auditory training skills for the client to learn to monitor his speech may be one reason why the management program fails at a later stage. Even though tactile and kinesthetic training was not included as part of the survey, it may be that these senses would be helpful in the acquisition of articulation skills.

Client Self-evaluation. Client self-evaluation was considered the most popular and effective strategy used by the clinicians (Figures 1 and 2). Eighty-three per cent of the respondents reported using self-evaluation with their clients. As with auditory discrimination skills, the client should evaluate the correctness of his production in order to monitor his speech in a variety of environments. Again, if he is not able to evaluate his own speech, he may not be able to continue

to use his target sound correctly over time. Client self-evaluation presupposes auditory discrimination skills on the part of the client. Because client self-evaluation was believed to be very effective, but auditory discrimination training was only moderately effective, many clients may be starting the program with adequate skills for self-evaluation. Those who do not have adequate auditory, tactile or kinesthetic skills may need more extensive management in this area than the clinician provides.

Practice Until Responses Are Automatic. Seventy-one per cent of the clinicians reported that they have the client practice until responses are automatic, making it the fourth most often used technique (Figure 1). Those who use this method consider it the second most effective technique used (Figure 2). A similar study conducted in 1970 with North Dakota clinicians found skill automatization to be the second most frequently used technique even though only 27 per cent of the respondents reported using automatization in management (Johnson, 1972). One reason this method is not more frequently used, even though it is felt to be effective for those who use it, may be a time factor. Some clinicians consider their clients "underserved" and that more time is needed for management at the carryover level. Unfortunately, automatization takes time.

Creative Dramatics. Even though creative dramatics is widely discussed in the literature (McIntyre and McWilliams, 1959; Hayes, 1976; Via, 1976; and Bush, 1978), less than half of the clinicians, 46 per cent, use this method with their articulation disordered clients (Figure 1). Those who do use the method do not list it among their most effective practices for carryover (Figure 2). One possible reason

for these results may be that the respondents may be operating under a different definition of "creative dramatics" so in actuality may be using this method but not reporting its use.

Creative dramatics is a technique designed to give the client the opportunity to practice the target sound in a variety of situations. This questionnaire used the term "creative dramatics" loosely by including in the category prepared material such as plays, poems and stories. Several problems may influence the usefulness of creative dramatics as a management technique. One problem may be that the client must be at the conversational level of production before he/she is to use the target sound in structured or unstructured speaking situations. Creative dramatics, therefore, is not a technique which can be integrated into all stages of management. Another problem may be that unstructured tasks require greater amounts of time to elicit a given number of responses. A third problem may be lack of time available for the clinician to plan the spontaneous events. A final consideration is pressure to dismiss clients who are at the conversational level because of extensive caseloads and administrative pressure to serve more clients.

Practice under Emotional Conditions. Using new responses under emotional conditions, a technique advocated by Van Riper and Irwin (1966), was used by only 12 per cent of the respondents to this survey (Figure 1). As a result, this technique was the least often used of the twelve methodologies listed on the questionnaire. The clinicians also ranked it as the least effective technique (Figure 2). This contradicts the Johnson (1972) study which found this technique used by 23 per cent of the respondents, making it one of the five most used methods. One reason for this difference in findings may be in the

wording of the questionnaire item. The item in the Johnson (1972)
study asked if the clinicians employed "exciting games and conversa-
tion" in their management programs. This item was more explicit than
asking if the clients practice "under emotional conditions" and may
have elicited a greater response rate as a result.

An Emerging Hierarchy in Carryover. It is this investigator's
opinion that analysis of these five methodologies: auditory discrimi-
nation training (and including other sensory skills), client self-
evaluation, automatization of responses, creative dramatics and prac-
ticing under emotional conditions, naturally pattern themselves into a
hierarchy which may benefit carryover (Figure 3). The most basic of
these skills appears to be auditory discrimination training. The
client's ability to hear the differences between correct and incorrect
responses forms the foundation of the hierarchy. This step must be
completed before the child is able to evaluate his own production for
correctness, i.e., auditory discrimination skills appear to be a pre-
requisite skill for client self-evaluation. Client self-evaluation,
the second stage of the hierarchy, can occur at all levels of produc-
tion from syllable to conversation. Client self-evaluation is impor-
tant in that the client must be able to evaluate the correctness of his
speech without outside help. This may enable him to know when he is
using his correct sound no matter what environment he is in.

Auditory discrimination skills appear to precede the development
of client self-evaluation skills yet only 53 per cent of the clinicians
who reported using self-evaluation in intervention use auditory
discrimination training. Seven clinicians who completed the survey use
auditory discrimination training but do not have their client go on to
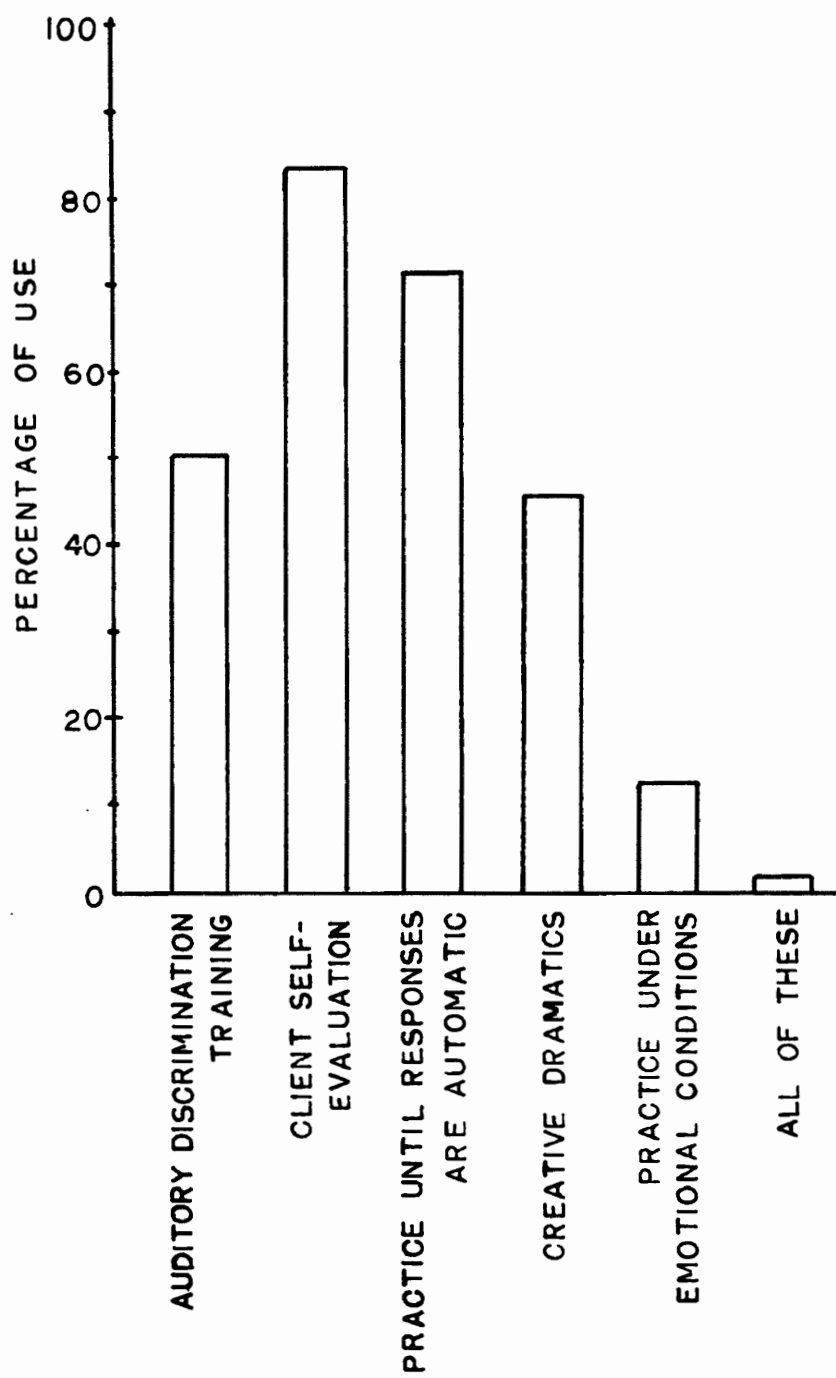
Figure 3. Methods included in the proposed carryover hierarchy and their percentage of use.

evaluate his/her speech.

The third step in sound acquisition, automatization, can be broken down into three phases: 1) repeated practice in the clinic, 2) story telling, skits and poems (also called "creative dramatics"), and 3) practice under emotional conditions. Of the 126 clinicians reporting data, only two noted using all five of the above mentioned techniques: auditory discrimination training, client self-evaluation, repeated practice, "creative dramatics," and practicing under emotional conditions. The first two steps of the hierarchy, auditory discrimination training and self-evaluation, generally take place within the confines of the clinic room. Automatization begins in the clinic room with practice and repetition until the student is able to produce the target sound without planning or deliberation. Games and contests are situations in which the automatization of the sound is tested. This may be important because, for carryover to be successful, the client must be able to use his target sound correctly in a variety of speaking situations over time.

Behavior Modification. Behavior modification may be used in conjunction with any or all of the methods composing the hierarchy proposed above and may facilitate carryover as a result of specific programming of all components including: planned reinforcement schedules and gradual altering of behavior toward improved articulation skills. Fifty per cent of the 126 respondents reported following a structured behavior modification program making it one of the lesser used techniques (Figure 1). This methodology was evaluated as the third most effective technique for promoting carryover, however (Figure 2). Of the clinicians who rank ordered this technique, 32 per

cent considered it to be their most effective method (Table I).

No data are available as to why so few clinicians use behavior modification techniques as a management approach. One can speculate as to possible reasons, however. Lack of training in behavior modification techniques may prevent some clinicians from incorporating this approach into their management programs. Another reason may be a perceived lack of time to take baseline data, track client responses or follow structured reinforcement schedules.

Other Methods Reported by the Clinicians. Clinicians noted additional methods which they use in management with articulation disordered clients. One of the techniques mentioned is a timed sound production task in which the clinician times a conversation while counting client errors. The timed segments increase in duration. Bankson and Byrne (1972) studied the effect of a timed correct sound production task on carryover. More specifically, they investigated the effect of a training task that included correct sound production of words as a subject read a word list at increasing rates of speed. Probes of conversational speech indicated that four of the five children in the study showed varying degrees of carryover. The subjects who showed the greatest improvement tended to have the highest number of correct readings. This technique would be appropriate to use at the first phase of automatization where the client must practice until the responses are automatic.

Another approach to carryover mentioned by the clinicians surveyed includes making the program goal oriented. One way of doing this is for the client to work with a contract. Other means of goal orientation can be to have the client monitor his progress or to have

progress charts for the client to complete. All of these techniques can be followed by reinforcement such as working for a row of stars or an opportunity to play educational games.

Methods Used Outside the Clinic

Many of the techniques, materials and equipment discussed may be used outside the clinic as well as within the clinic. Some techniques used by the clinician, such as sending home assignments or working with the client outside the clinic room, are most often considered to be techniques used in environments other than the speech room.

Working with the Client Outside the Clinic. Working with the client outside the clinic room, the fifth most often used and fifth most effective management technique (Figures 1 and 2) was used by 63 per cent of the clinicians. Clinicians report "time" as a problem in providing carryover activities, time to work with the client outside the clinic room. They also report working in environments other than the speech room difficult in terms of 1) providing instant reinforcement for correct responses and 2) utilizing a wide variety of environments. A possible advantage of this technique could be that clients may have the misperception that correct articulation is limited to the clinical setting. Working with the client outside of the clinic room may help to alter that view.

Clinician Developed Homework. Assigning homework to the client, the second most popular management technique, was used by 81 per cent of the clinicians (Figure 1). Even so, this method was perceived as the second least effective technique (Figure 2). Some possible problems in promoting carryover, as reported by clinicians, deal with

client homework and may reflect some of the reasons for its perceived
low effectiveness. Several clinicians believe client responsibility is
a problem in carryover. More specifically, they blame inconsistent
practicing and a lack of motivation to complete homework as reasons for
its apparent ineffectiveness. Another factor interfering with client
completion of homework may be that students are "too busy" with extra-
curricular activities to complete their speech homework.

Client Developed Homework. Client developed assignments may help
to alleviate some of these problems by placing responsibility of
designing and completing homework with the client. By designing his
own homework the client may more clearly understand the relationship
between using correct speech in the clinic and using correct speech at
times other than during the management sessions. However, only 21 per
cent of the clinicians have their clients develop their own homework
(Figure 1). Reasons for this low figure may be that it is more conven-
ient for the clinician to develop and assign the homework. This was
also considered to be one of the least effective methods for promoting
carryover (Figure 2).

Reminders in the Client's Environment. The client or clinician
may distribute reminders in the client's environment to provide a
stimulus for good speech (Engel et al., 1966). In the Johnson (1972)
study none of the clinicians surveyed reported distribution of reminders
in the environment. One clinician, however, noted instructing the
child to put flowers on the bedposts to remind him/her to use good
speech. Sixty-two per cent of the Oregon clinicians distribute remind-
ers in the client's surroundings. Of the twelve methods evaluated in
this survey, this was the sixth most often used and the eighth most

effective method (Figures 1 and 2). The questionnaire did not elicit specifics concerning the nature of the reminders. Some reminders suggested in the literature are "pictures pasted on the bathroom mirrors" or bookmarks (Engel et al., 1966).

Language Arts Programs. Sutton (1955) considers an intervention program combined with the student's language arts program as one of the most practical and rewarding methods of reinforcing a pupil's progress. Even so, only 29 per cent of the respondents to this survey reported using this technique (Figure 1). This concurs with Johnson's (1972) results, where 17 per cent of the respondents to her questionnaire combined management with the language arts program. In the present study, this method was not believed to be an effective management technique (Figure 2). Combining these two programs requires time, teacher cooperation and clinician cooperation. Time is required to review the material covered in the language arts program as well as the objectives of the speech program. Planning is needed to blend the two programs into a compatible curriculum, to implement the program, and to carry it through with the client. Speech clinicians are not the only school personnel with busy schedules; classroom teachers also have many demands placed on their time. For these reasons, clinicians may not find combining speech management with the student's language arts classes an efficient or effective technique.

In spite of these drawbacks, the advantages of combining language arts and speech programs are numerous. The language arts program: 1) provides opportunities for the student to use what he has learned in speech sessions; 2) provides a link between classroom material and speech management material; 3) gives the child an opportunity to use

his correct speech outside the clinic room; and, 4) allows the clini-
cian to judge the client's performance in novel situations (Sutton,
1955).

Client Works with Others. One of the most often discussed carry-
over practices is that of the client working with individuals other
than the clinician (Lillywhite, 1948; Marquardt, 1959; Engel et al.,
1966; Carrier, 1970; and Wing and Heimgartner, 1973). Seventy-nine per
cent of the clinicians surveyed utilize outside individuals to work
with their clients, making it the third most often used technique
(Figure 1). Data are contradictory, however, in that all of the
respondents to the questionnaire noted outside individuals that they
included in management but only 79 per cent reported it as one of their
management techniques. One possible reason for this difference may be
that only 79 per cent of the clinicians involve outside individuals in
direct management of carryover. All of the clinicians may contact
individuals at one time or another about the client's progress, thereby
involving them in management on an indirect basis. Clinicians ranked
this technique as their fourth most effective method for promoting
carryover (Figure 2).

People Included in the Management Program

The involvement of outside people in management, the fourth most
effective technique, was delineated as to which individuals were
included in management programs. More specifically, clinicians were
asked if they involved speech aides, classroom aides, classroom teach-
ers, speech pals, peers, or parents in intervention.

Parents. The client's parents, one of the two most often

included sources of help with intervention, were relied upon for assistance by 94 per cent of the clinicians (Figure 4). They also were considered the most effective source of help (Figure 5). This percentage which includes parents is much higher than the results of the Johnson (1972) study in which only 40 per cent of the clinicians reported parental involvement. One reason for this increase may be due to the advent of the Individualized Educational Program (IEP). Many more parents than before are meeting with clinicians to discuss their children's educational program. In this manner, more parents may be becoming involved, whether directly or indirectly, in the management program. The clinicians who noted involving parents consider them to be the most effective individual included in management.

Clinicians reported a variety of techniques designed to include parents, both directly and indirectly, in management. Some clinicians use an indirect approach, maintaining parental awareness of the client's progress through phone contact or notes sent home. The advantage of indirect involvement may be that it is compatible with busy schedules, is convenient for both the clinician and the parent, and is not as time consuming as direct management. Others rely on direct parental involvement through parent participation in the clinical sessions, in home assignments, or through parent training programs.

Parent training, a technique described in the literature by several authors (Lillywhite, 1948; Carrier, 1970; Fudala, England and Gangoung, 1972; Carpenter and Augustine, 1973; Fudala, 1973; and Wing and Heimgartner, 1973), has been reported to be an effective management practice. Several respondents to the survey placed a qualifier on this view, noting that only concerned, motivated parents are an asset to
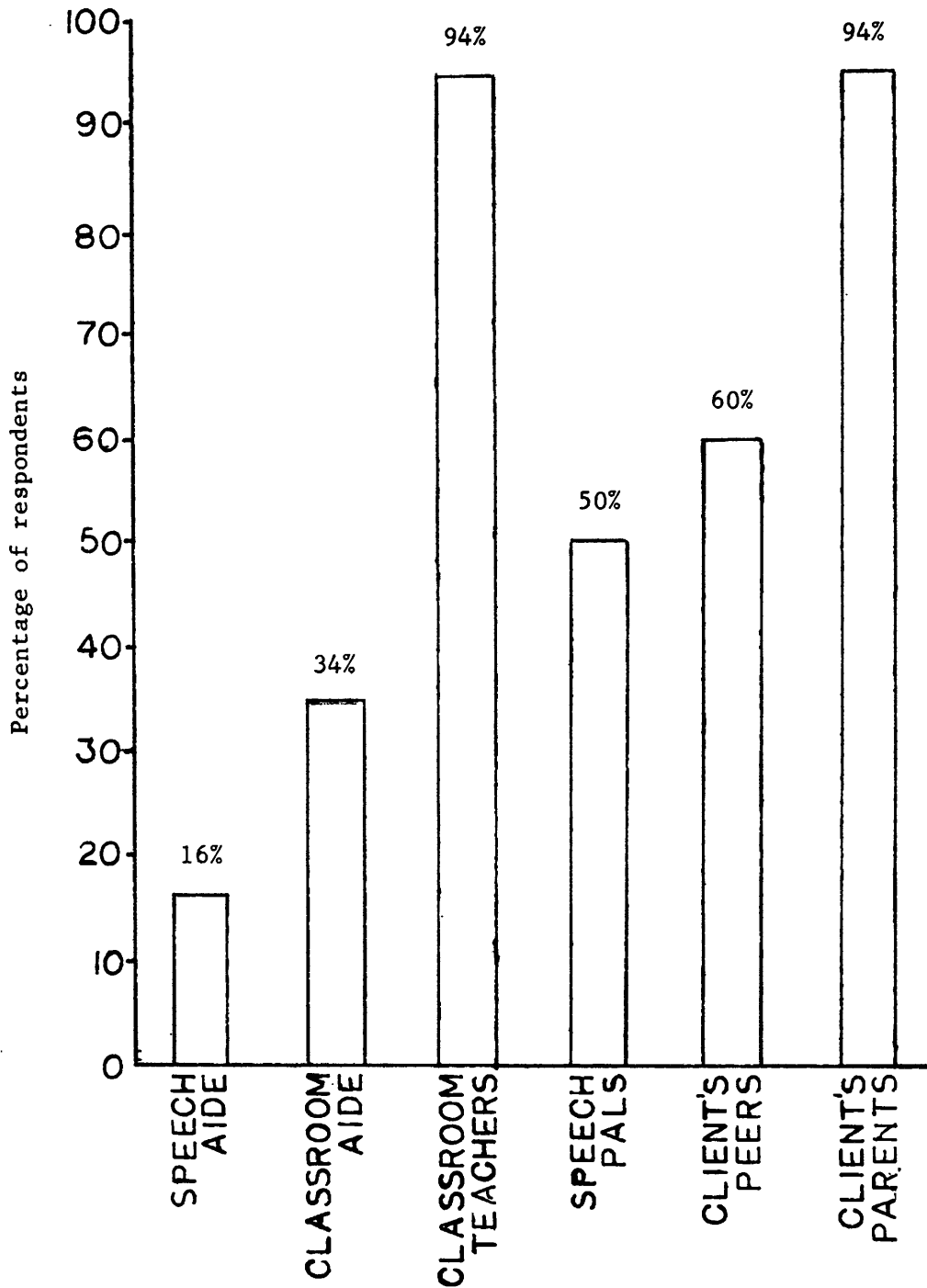
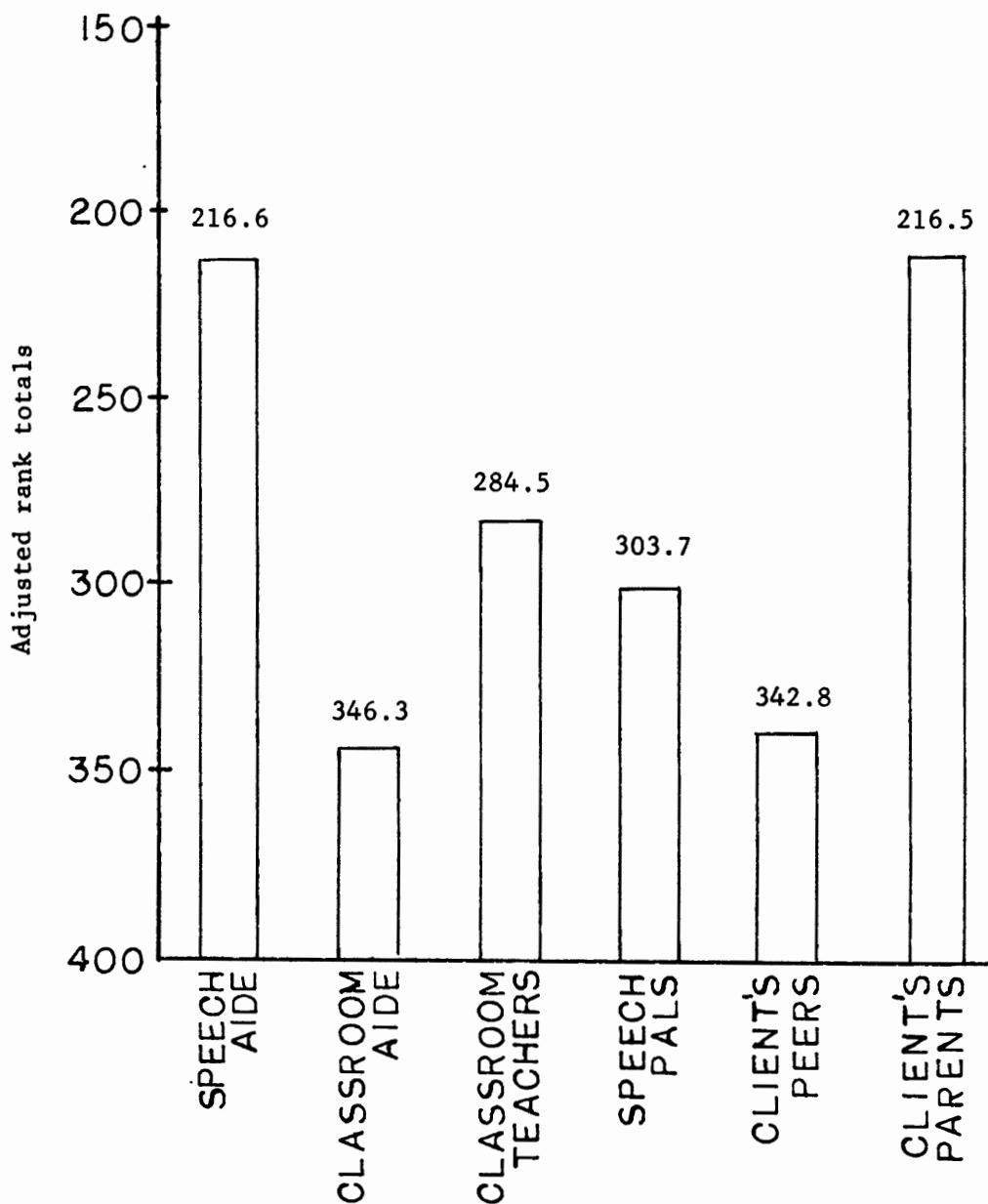Figure 4. Percentage of clinicians who include a given individual in management.

Figure 5. Perceived effectiveness of outside individuals in management to promote carryover.

management. Parents who do not recognize the need for management or do
not support the efforts of the clients or clinicians may be a detriment
to intervention. This view is supported by McCroskey and Baird (1971)
who did not find parents as a group to make a significant contribution
to intervention. They concluded that parents who do not initiate a
management program or assume responsibility for intervention represent
a different sample than has been used when positive results are
reported. Fudala (1973) supports parental involvement as a viable
approach to management if parents are willing participants in the pro-
grams, are given specific instructions on management techniques and
observe at least three management sessions.

The parent training programs reported by the clinicians ranged
from parent observation of the management program to parent visits to
speech sessions for demonstrations of management techniques to "parent
night" where parents were trained by the clinicians to work with their
children. Approaches mentioned that are designed specifically for
parents included: 1) making "speech games"; 2) monitoring the child at
specific times; 3) participating in speech sessions; or, 4) helping the
child with his homework assignments. Unfortunately, training programs
are time consuming for both the clinician and the parents. Any program
developed must be accountable by providing benefits commensurate with
cost and energy input. An additional problem, not mentioned in the
literature, is the growing number of working mothers and single parent
households. Parents may not be able to attend training programs as
easily as in the past. However, clinicians appear to be adapting to
these changing times by including after school babysitters in the
management program.

Classroom Teachers. Ninety-four per cent of the clinicians reported including classroom teachers in their management programs (Figure 4). This is in contrast to the Johnson (1972) study in which only 7 per cent of the clinicians involved classroom teachers in management. One reason for this difference may be that clinicians and classroom teachers are meeting during I.E.P. conferences to discuss the child's program. These conferences pose an excellent opportunity to inform the teacher concerning the child's management program.

Even though clinicians in Oregon involve teachers in management as often as parents, teachers were not perceived to be as effective (Figure 5). This may be because teachers are often busy and unable to devote individual attention to particular children on a regular basis. Parents, on the other hand, may be with the child more often on a one-to-one basis than the teacher, enabling them to note progress and reinforce correct speech. Also, parents as a group would naturally be more concerned with and aware of their child's progress than the classroom teacher.

Client's Peers. Involving the client's peers, a technique discussed by Engel et al. (1968), is another source of assistance with management. Sixty per cent of the clinicians reported including the client's peers in management, making it the third most often used source of outside help (Figure 4). In contrast, Johnson (1972) found that none of the clinicians she surveyed "employ popular children to supervise practice between the children's visits." Even though this appears to be an often used management technique with Oregon clinicians, it was not perceived to be one of the more effective methods in that it was ranked as one of the two least effective sources of outside

help (Figure 5). The literature discusses peers as a viable source of assistance but notes that cost accounting is a problem (Groher, 1976). Training the peers to discriminate, evaluate then reinforce appropriately may be more time consuming than the benefits are worth. Also, some teachers may be reluctant to allow non-speech handicapped students to miss classroom activities on a regular basis.

Speech Pals. "Speech pals" is a specific name assigned by Marquardt (1959) to the client's peers who accompany him/her to management sessions as well as assist the client between visits. Evidently there is a distinction in the minds of public school clinicians between speech pals and client peers, in that speech pals were included in 50 per cent of the management programs in contrast to peers, who were included in 60 per cent of the programs (Figure 4). The distinction between "speech pals" and client peers may rest with the perception that "speech pals" are trained members of the client's peer group, while the client's peers are associates with no involvement in the formal management program. Speech pals, though reportedly used less frequently, were considered more effective than the client's peers (Figure 5).

Classroom Aides. Classroom aides were incorporated into the management programs of 34 per cent of the clinicians, but this source of help was considered the least effective of those noted on the questionnaire (Figures 4 and 5). Reasons for this may be that aides are not trained to work with speech disordered children so may not be prepared to evaluate correctness of articulatory skills. Also, aides are not necessarily involved with classroom activities. They may spend the majority of their time preparing materials, may see the children on a

sporadic basis, or may not have time to consult with the clinicians as to the expectations for various children. For these reasons, their participation may be inconsistent, at best.

Speech Aides. The least used source of outside help, speech aides, was included in 16 per cent of the management programs (Figure 4). In contrast, those who use aides in their programs find them to be an extremely effective source of help (Figure 5). Of the twenty clinicians who evaluated the use of speech aides, ten (50 per cent) ranked them as their most effective source of assistance (Table II). Sixty-one per cent of the respondents to the survey expressed a desire to have a speech aide as part of their program, pointing out the need for effective help with management programs.

One weakness of the questionnaire was that it did not include specific information concerning the number of clinicians who currently have aides. These data would allow for comparison of availability of aides with their frequency of involvement in the management program. Currently, aides compose a part of the program of 17 per cent of the clinicians. Another 61 per cent of the clinicians would like to include aides in their management program. This leaves 22 per cent of the clinicians on which no data are available.

Other Individuals Involved in Carryover. Other sources of help used by the clinicians who responded to the questionnaire include: secretaries, principals, counselors, janitors, librarians, resource room teachers, reading teachers, music teachers and family members other than parents. There are no data regarding how often these other persons are utilized or how they are incorporated into the carryover program.

Hierarchy of Individuals. Clinicians who include several individuals in their management programs may wish to consider developing a carryover hierarchy. This hierarchy would presuppose that some individuals, such as the school principal or a particular teacher, would be more stressful than parents or peers. Once a hierarchy was established, the student would use this target sound with that person with whom he/she was the most comfortable. After successful use of the target sound with low stress individuals, the client could move up the hierarchy to a more difficult speaking situation. For example, a given client may be comfortable using his new sound at home with his family but may change to old speaking patterns in the classroom. That student would begin using his/her speech with parents and siblings, then possibly with peers in an informal situation such as the playground. The student would gradually develop his skills in a variety of situations before using the target sound in the classroom. This hierarchy may change from student to student but could easily be determined in a brief conversation with the child. Speech assignments could follow the hierarchy in a programmed manner.

Materials and/or Equipment

Programmed Materials. Clinicians were asked what materials and/or equipment they used in their management sessions. Eighty-two per cent of the respondents reported developing their own carryover programs (Figure 6). This is in contrast with commercial programs, which were used by 52 per cent of the respondents (Figure 6). Clinician developed programs were not only the most popular material or equipment, but were also considered the most effective (Figure 7).
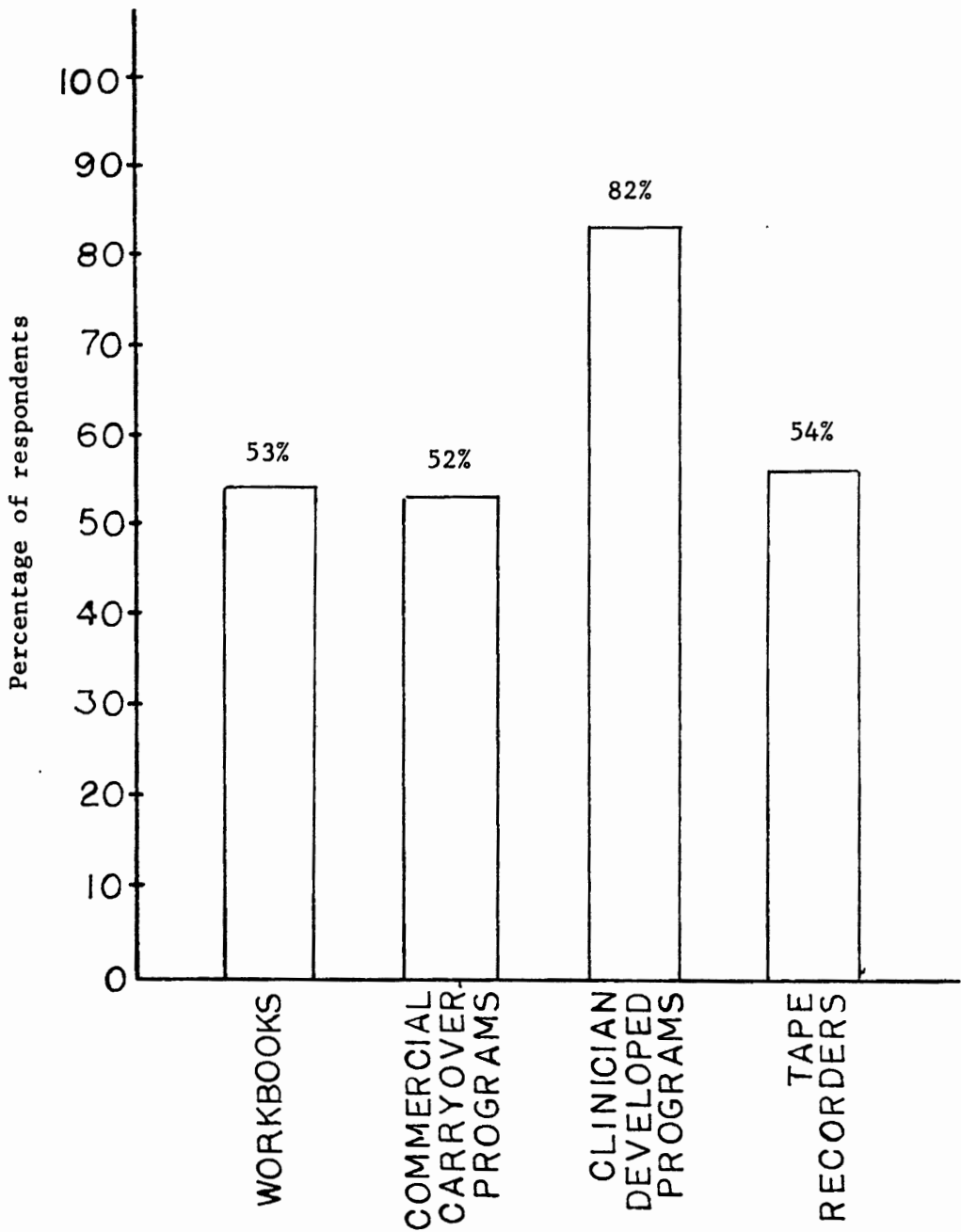
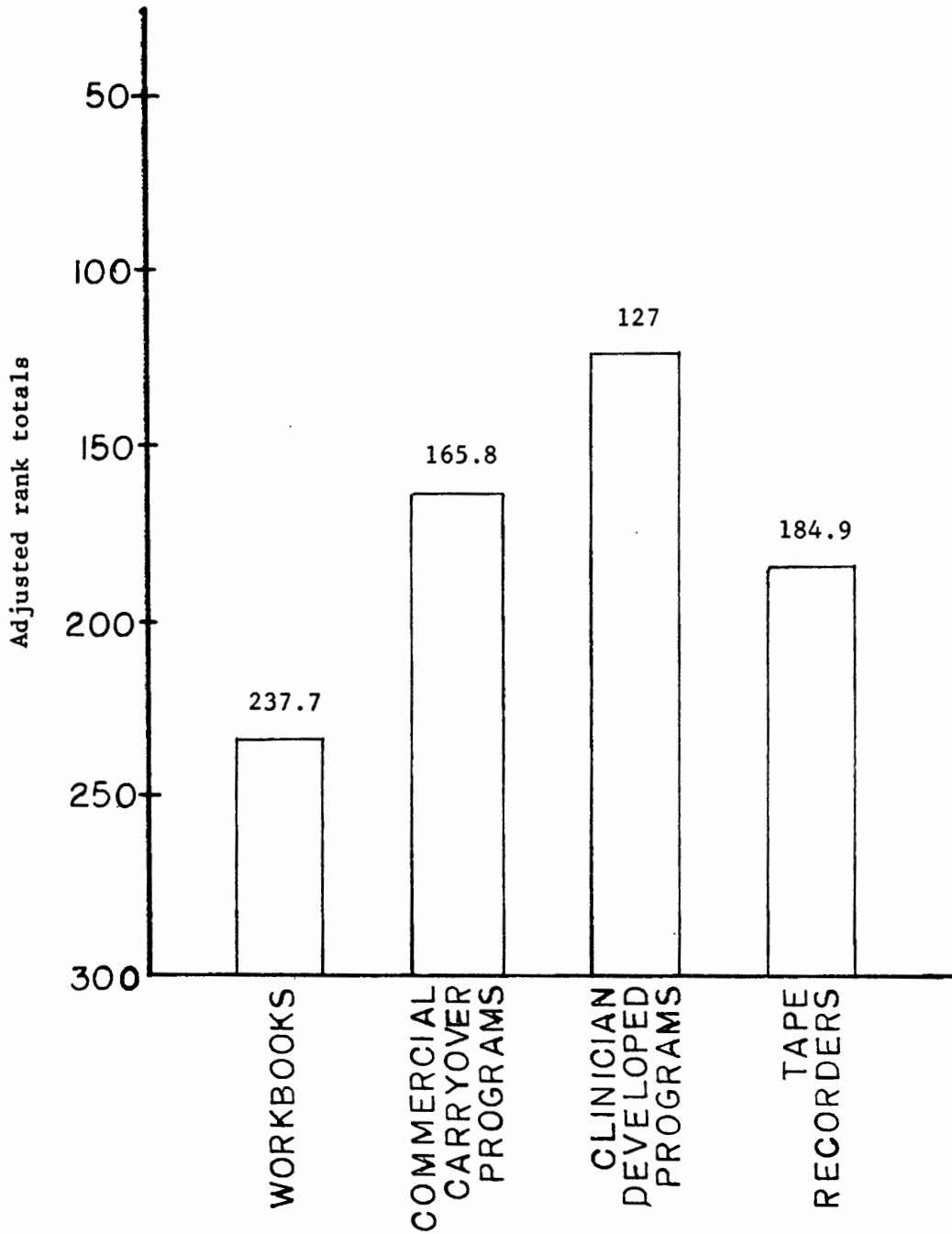Figure 6. Percentage of clinicians who include given materials or equipment in management.

Figure 7. Reported effectiveness of materials and/or equipment used in management to promote carryover.

Commercial carryover programs were reported to be the second most effective item (Figure 7) but the difference between the two values was considerable. The clinicians who develop their own programs may find them more effective than commercial programs because of program familiarity and the fact that the programs can be tailored to the clinician's particular methods and needs. The perceived effectiveness of commercial programs may indicate a dissatisfaction with the materials currently available. This conclusion was supported by the portion of the questionnaire reporting the problems with carryover management in which clinicians noted a need for more effective commercial programs. This, also, may be a reason so many clinicians reported devising and using their own programs rather than relying on those which are commercially developed.

Tape Recorders. Fifty-four per cent of the clinicians reported using tape recorders in their management sessions, as well as ranking them the third most effective item in this category (Figures 6 and 7). In comparison, 17 per cent of the North Dakota clinicians surveyed reported "using tape recorders to demonstrate progress" (Johnson, 1972). A disadvantage of using tape recorders may be that they are expensive, with the price increasing proportionately with the quality of the equipment. On the other hand, tape recorders would provide the client with immediate feedback in the form of a permanent record of his/her production. Also, samples of the client's speech over time could be compared as a means of noting progress.

Workbooks. Workbooks, used by 53 per cent of the clinicians surveyed, were perceived to be the least effective item in this category (Figures 6 and 7). One reason for the poor evaluation of work-

books may be that the materials must be adapted to the specific needs of the client. An often written comment on the survey was that no two clients are alike. Because of these individual differences, the materials that suit a particular client may not be appropriate for another. An advantage of incorporating workbooks into the management program is that the materials are already prepared, alleviating clinicians from spending preparation time developing their own materials.

Other Materials or Equipment. Other materials or equipment used by clinicians to promote carryover included: language masters, tally counters, worksheets, stimulus cards, games, video-tapes, a Voxcom, an s-indicator, the telephone, tracking sheets, assignment cards, text-books, library books, conversation charts and speech reminders.

The language master, the most often mentioned of these materials, can allow the student to work independently of clinician supervision. A correct model for imitation by the student is provided via tape recorded master cards. The student records his own production in response to the model; then plays both the model and his production back for comparison. To use this equipment the student must be capable of comparing his production with a tape recorded model and then evalu-ate that production for correctness. Unfortunately, not all schools have language masters readily available for student use. Also, stu-dents must be mature and responsible enough to work independently.

Tally counters, also mentioned by several clinicians, are a con-venient and economical means of recording data. These counters can be used by the client as well as the clinician to record correct and/or incorrect productions of the target sound.

Reported Problems in Attaining Carryover

Factors reported as key problems in carryover include: 1) the client's attitude; 2) follow through and support by outside individuals; and, 3) clinical management practices.

Client Attitude

The client's attitude toward his speech may be the most important factor in the success of management. Fifty-six clinicians reported client attitude toward speech management as a major problem in carryover. It appears that the more motivated, interested and aware the client is, the shorter and more effective the management program. On the other hand, children who are not motivated to change their speech patterns may not: 1) complete homework assignments; 2) practice consistently; 3) monitor their speech in a variety of situations; or, 4) attend speech sessions on a regular basis. The clinical impression of those reporting is that these children do not appear to progress as rapidly as the motivated child and may not successfully carryover the skills learned in the clinic to everyday environments.

Follow Through and Support by Outside Individuals

Eighty-one respondents noted a lack of help from outside individuals as a problem in promoting carryover. Of these eighty-one clinicians, fifty believe poor parental attitudes are a major factor in the failure of carryover. These problems appear when parents: 1) are too busy to work with the child; 2) are unsupportive of the speech program; 3) tell the child his speech is fine the way it is; 4) provide poor speech models; 5) don't follow through with home assignments; or, 6)

believe speech management to be restricted to the school setting. Even if parents are willing to assist with management, clinicians report that the parent still may not provide consistent reinforcement or reward correct productions of the target sound.

Nineteen clinicians believe the teacher's attitude toward the speech program may influence the carryover process. Clinicians report that teachers are often "too busy" to help, are not trained to evaluate a child's speech production, help in a sporadic manner, or reward incorrect speech patterns. The client's peers also were reported to be a hinderance to progress if those peers reinforce the client's old speech habits and patterns.

Intervention Programs

Time. Forty-one clinicians believed a major problem with carry-over lay with clinical management practices. Of those forty-one clinicians, twenty-six blamed time limitations for their problems. One demand on the clinician's time is administrative duties. Clinicians believe they spend "too much" time with meetings, paperwork and conferences and not enough time on management programs. Another demand for time lies with annual diagnostic, screening and evaluation programs which compose the bulk of the program every fall. Once screening and evaluations are completed, management can begin. Unfortunately, management also seems to demand more time than is available. Time is required to: 1) develop an effective management program; 2) implement that program; 3) see the child on a daily basis; 4) instruct other individuals working with the client; and, 5) carry out a maintenance program once the skills are acquired.

Caseload Size. Caseload size is reported by clinicians to affect carryover. Encouragement to accept new clients increases the caseload size. Group management, the result of large caseloads and limited time constraints, appears to be a universally used management technique (Chapman et al., 1961). Sommers (1966) reported group management and individual management to be equally effective. Several respondents to the questionnaire do not agree with this view. Their clinical impression is that carryover is attained much more quickly when the clinician works with the client on an individual basis. Individual management sessions have the advantage of being more flexible in meeting the needs of a particular child and of eliciting a higher rate of response from the client during a given time period. Group management may not be as flexible in that it must meet the needs of several students simultaneously. Also, the larger the group, the fewer the responses elicited from each child. Groups appear to be more cost efficient, however, in that more students are served per clinician hour and, in special situations, can be more effective.

Onset of Management. Another view of management involves timing the introduction of correct speech production to the child's physical, intellectual, social and emotional maturational levels. Difficulty arises when determining at what point the child has reached this point of readiness. Some clinicians surveyed advocated a "the younger, the better" policy of correcting errors in speech as soon as they are detected. These clinicians reported the best success with younger children and advocated beginning management with children in kindergarten or the first grade. The philosophy underlying this approach is that the sooner intervention is begun, the easier it will be to change

habitual behavior and to achieve carryover of that behavior. A second view reported in the survey was that many, if not most, clients self-correct without any management (Bralley and Stoudt, 1977). Supporters of this thinking advocate waiting until the child is a third or fourth grader and is more mature and capable of being an active participant in the management process. Older children will demonstrate greater degrees of carryover due to their more mature approach to management. A third philosophy reported in the survey is that age of the client is irrelevant in deciding when to begin management and that age of the child does not influence carryover.

Program Emphasis. Clinicians reported a shift in emphasis that has occurred in management over the last ten years. The major focus of management has moved from articulation disorders to language disorders. Some clinicians support this change in management thrust as an improvement in clinical services. Others do not agree with this trend. They see articulation management as being reduced to a level of non-significance with language problems being the only important issue that warrants our "professional expertise." Because of this shift in emphasis clinicians no longer have the time they once did to spend with their articulation disordered clients yet the ultimate goal of management, carryover, remains the same.

Management Practices

Clinicians, on the average, reported seeing clients for articulation management 2.3 times each week. Clients were seen an average of 50 minutes a week with each session usually 25 minutes in length. Duration of management per week ranged from 20 minutes per week (one

session twenty minutes in length) to 120 minutes (four sessions, each of which were thirty minutes in length).

Clinicians reported a variation of from one week to 34 weeks of management before the client produced the target sound correctly in conversational speech in the clinic room (Figure 8). The mean value was 13 weeks, a finding supported by the Johnson (1972) study in which clinicians reported spending an average of 14 weeks of management before the client produced the target sound in the clinic room. The average length of time needed before the client produced the sounds outside the clinic room, as reported by clinicians in Oregon, was 24.5 weeks with a range of data from five weeks to 72 weeks (Figure 9). This time frame is only half as long as that of 51 weeks reported by Johnson (1972). Clinicians were asked what percentage of their management program was spent on carryover. The most common answer was 20 per cent, as reported by 42 (33 per cent) of the 125 respondents to this item. The responses varied greatly with 24 clinicians (19 per cent) spending 10 per cent or less on carryover, 26 clinicians (21 per cent) spending 40 per cent of their program on carryover, 6 clinicians (5 per cent) spending 80 per cent of their program on carryover, and 10 clinicians (8 per cent) spending 90 per cent or more of their program on carryover (Figure 10).
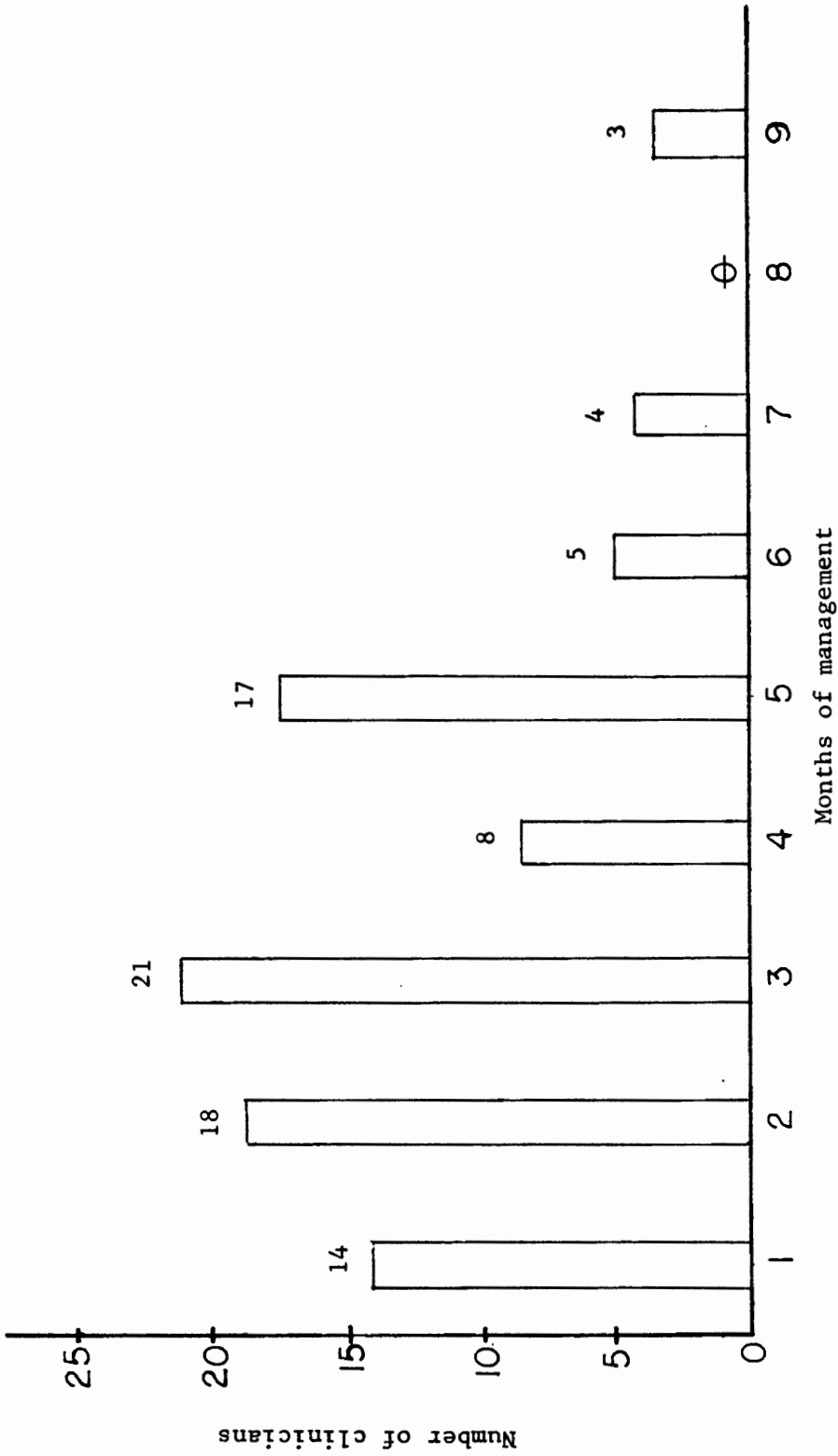
Figure 8. Reported MONTHS of management needed until the client uses the target sound in conversational speech IN the clinic room.
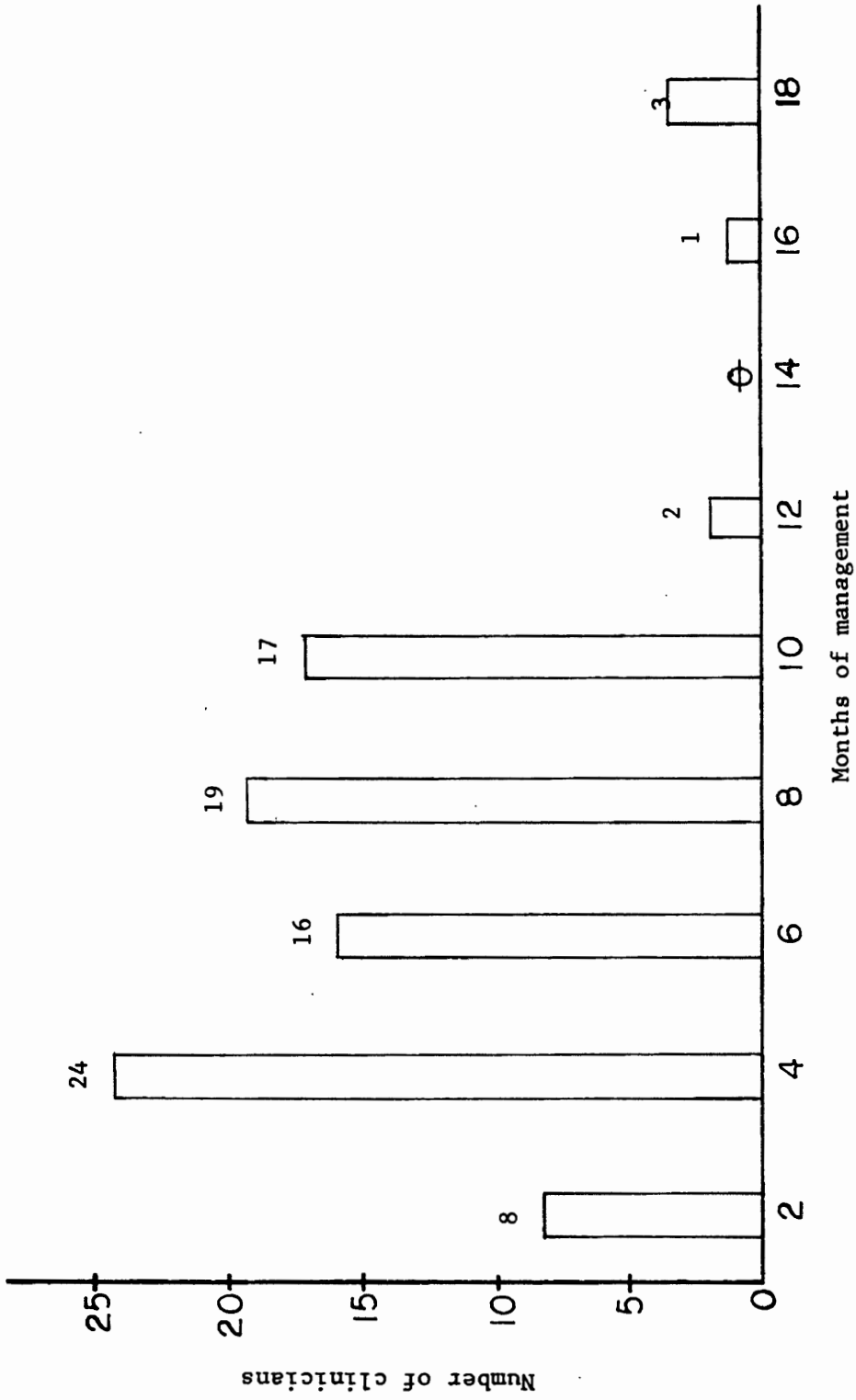
Figure 9. Reported MONTHS of management needed until the client uses the target sound in conversational speech OUTSIDE the clinic room.
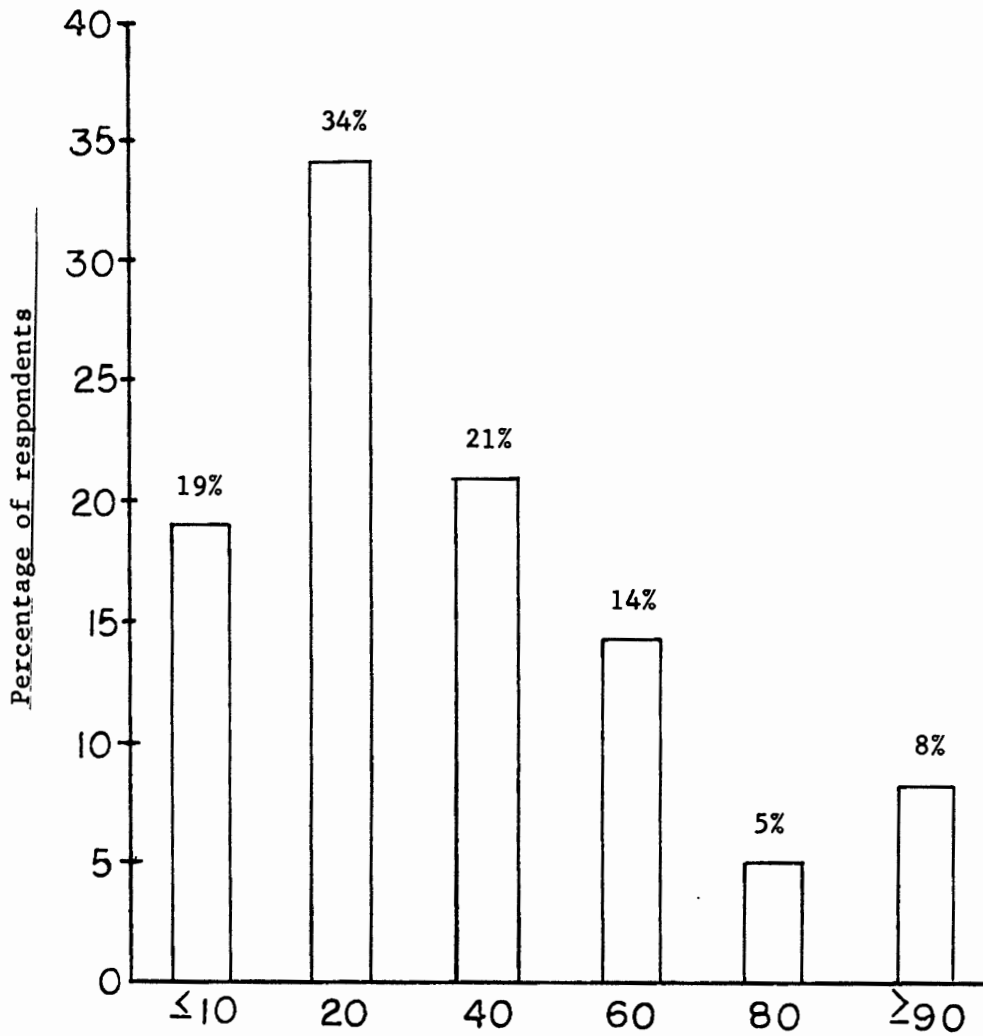
Figure 10. Percentage of articulation management program devoted to carryover, as reported by 125 clinicians.

CHAPTER V

SUMMARY AND IMPLICATIONS

Summary

Clinicians report that carryover management is one of the most difficult and time consuming problems they face (Johnson, 1972) yet the literature offers little data to assist clinicians in determining what methodologies should be used and which are effective in facilitating carryover. The purpose of this investigation was to determine the type of methodologies utilized by public school clinicians in Oregon to facilitate carryover with clients originally diagnosed as having articulation disorders. A secondary question dealt with the perceived effectiveness of these methodologies.

A description of current practices and trends in articulation management programs was derived from answers to a questionnaire sent to 200 public school clinicians in Oregon. One hundred and twenty-six of the 159 questionnaires returned were used in the tabulation of results.

Clinicians in Oregon participating in this study employ a variety of methodologies in their carryover programs. Four management techniques were reported used by 70 per cent or more of the respondents to this survey: client self-evaluation; client completion of homework assignments; client works with individuals other than the clinician; and, client practices until responses are automatic. The four most effective management techniques were: client self-evaluation; client

practices until responses are automatic; following a structured behavior modification program; and, client works with individuals other than the clinician. The individuals most often included in management were classroom teachers and the client's parents. The most effective individuals, however, were the client's parents and speech aides. Clinician developed carryover programs were reported to be the most often used as well as the most effective material or equipment. Discrepancies in data due to questionnaire design should be studied further.

Research Implications

Questionnaires of the nature used in this study often generate more questions than are answered. Replication of the study with a wide variety of populations, such as public school clinicians who hold bachelor's degrees or clinicians in other geographical areas, would yield interesting data for comparison.

Many areas of the questionnaire warrant in-depth analysis. For example, one area of research may focus on the client's parents, a source of assistance in 94 per cent of the management programs surveyed. Data from this study concerning the effectiveness of parental involvement are inconclusive without knowledge of parent-client-clinician interactions. Direct parental involvement should be compared to indirect involvement. Techniques used within direct and indirect involvement should also be compared. Parental involvement could then be analyzed within and between these methods. These same questions can apply to the inclusion of any outside individual in management.

A second area amenable to research is the influence of time of onset of management on carryover. Some clinicians advocate a "the

younger, the better" policy, in which intervention begins as soon as errors are detected. Other clinicians support the philosophy of waiting until the third or fourth grade to begin management, allowing the client to mature physically, intellectually, socially and emotionally. The timing of onset of management may be an important variable in the effectiveness of carryover. Research is needed to determine the optimum time to begin management.

A third area of possible study deals with clinician developed carryover programs. Research to determine the components of these programs may result in the development of more effective commercial programs.

A fourth thrust of research may be the development of a hierarchy of methodologies designed to achieve carryover. Clinicians appear to include numerous management techniques in their programs, but these approaches do not appear to be organized into a cohesive whole. Research is needed to study the relationships of these techniques and to organize them into a usable program.

Clinical Implications

The University Setting

Respondents to the questionnaire reported a lack of training at the university level as one of the major problems in developing and implementing carryover programs. This training is difficult to provide in a university clinic where students work with a given client for a term or semester. Students may finish their clinical experience long before the client has reached the stage where the effectiveness of carryover programs can be measured. Training programs may be

strengthened if a clinician works with a given client throughout the entire management process from initial intake to dismissal following the monitoring of carryover.

Another option available to students, and one more practical for the university setting, is the development of a home maintenance program to be administered by parents. This program may benefit both the student clinician and the client in that it would provide the clinician with experience in developing a carryover program and may assist the client in the transition from the university management program to other environments.

The Public School Setting

A programmed hierarchial approach to articulation management appears to be more appropriate than the incorporation of a random selection of techniques in promoting carryover. For example, auditory discrimination training logically precedes client self-evaluation yet nearly half of the clinicians who use client self-evaluation did not report including auditory discrimination training in management. A programmed approach would establish the skills necessary for the client to discriminate between his correct and incorrect productions before progressing to the level of client self-evaluation. The client needs these skills in order to monitor his/her own speech when in environments other than the clinic.

Only 50 per cent of the clinicians reported using a structured behavior modification program in management yet it was determined to be the third most effective technique for promoting carryover. Public school clinicians may find combining behavior modification with their

current management practices to benefit carryover or shorten the time needed to complete the program objectives.

Speech aides, infrequently used but reportedly highly effective, were used by only 16 per cent of the clinicians. Their high effectiveness ranking indicates that clinicians believe inclusion of speech aides would benefit management programs. This may be accomplished through providing articulation on a more frequent basis and/or by allowing more time for the clinician to develop programs, contact outside individuals included in management or follow up on cases at the maintenance level. The effectiveness of aides in the speech program is demonstrated in the literature and by the results of this questionnaire. The individual clinician must show the need for an aide in his/her particular program and then lobby for the funding necessary to obtain that aide.

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APPENDIX A

DEMOGRAPHIC DATA

	# Clinicians reporting data	Mean value	Range
Caseload size per week	123	45 students	12-150 students
Number of schools served	123	3.5 schools	1-11 schools
Years clinician worked in public schools	117	8.3 years	1-28 years

ARTICULATION CARRYOVER QUESTIONNAIRE

Number of students in the school system (estimate):_____

Average number of students in your caseload per week:_____

Number of schools you serve:_____

Number of years you've worked in the public schools:_____

Circle the appropriate number.   Circle the appropriate number.
Level of training: Area of training:

   1. Bachelor's   1. Speech-language pathologist

   2. Fifth year   2. Audiologist

   3. Master's   3. Special Educator

   4. Doctorate   4. Other (specify)_____

Do you have a caseload which includes articulation disordered
clients? 1. yes   2. no   If the answer is "no," you need not
                                    continue. Please return this
                                    questionnaire so that I can remove
                                    your name from my mailing list.

      CARRYOVER, for the purposes of this study, is the transfer of
newly learned speech skills to all speaking situations outside the
clinical setting.

      ALL of the following questions deal with CARRYOVER in ARTIC-
ULATION MANAGEMENT. Please respond in terms of what you do to
promote carryover in your clients with articulation disorders.

1. What percentage of your articulation management program is devoted
    to facilitating carryover (correct usage of target sounds outside
    the clinic room)? Circle the appropriate answer.

    1. 10% or less

    2. 20%

    3. 40%

    4. 60%

    5. 80%

    6. 90% or more

2. Which of the following methods do you use to facilitate carryover?
Circle the number corresponding to ANY METHOD(S) you use. Rank
order ONLY THOSE YOU USE in the right hand column according to
their effectiveness, one (1) being the most effective.

CIRCLE those   RANK ORDER:
you use.   1 = most effective

1. follow a structured behavior modification program   _____

2. work with the client outside the clinic room   _____

3. distribute reminders in the client's environment   _____

4. incorporate creative dramatics (poems, stories,
   plays, etc.) into your management program   _____

5. integrate management with the language arts program _____

6. use auditory discrimination training   _____

7. have client evaluate himself   _____

8. have client work with others   _____

9. have client complete homework assignments   _____

10. have client develop his own homework assignments   _____

11. have client practice until responses are automatic _____

12. have client practice under emotional conditions   _____

13. other (specify)_____   _____

14. other (specify)_____   _____

15. other (specify)_____   _____

3. Who do you involve in carryover activities? Circle the number
corresponding to any individuals YOU INCLUDE in management. Rank
order THOSE YOU INCLUDE in terms of their effectiveness, one (1)
being the most effective.

CIRCLE those   RANK ORDER:
you use.   1 = most effective

1. speech aide(s)   _____

2. classroom aide(s)   _____

3. classroom teacher(s)   _____

4. speech pals   _____

5. client's peers   _____

6. client's parents   _____

7. other (specify)   _____

8. other (specify)   _____

4. What materials and/or equipment do you use to promote carryover?
   Circle the number corresponding to any materials and/or equipment
   YOU USE. Rank order ONLY THOSE YOU USE in the right hand column
   in terms of their effectiveness, one being the most effective.

CIRCLE those you use.	RANK ORDER: 1 = most effective
1. workbooks	_____
2. commercial carryover programs	_____
3. clinician developed carryover programs	_____
4. tape recorders	_____
5. other (specify)_____	_____
6. other (specify)_____	_____
7. other (specify)_____	_____

5. Given an ideal situation (i.e.: unlimited time, money, facilities,
   cooperation, etc.) which of the following that you don't currently
   use would you ADD to your articulation management program to promote
   carryover? Circle the number(s) corresponding to any you would ADD
   to your management program.

   CIRCLE those you would ADD.

   1. workbooks
   2. commercial carryover programs
   3. clinician developed programs
   4. tape recorders
   5. speech aides
   6, classroom aides
   7. speech pals
   8. client's parents
   9. creative dramatics
   10. structured behavior modification programs
   11. client self-evaluation
   12. client completion of homework assignments
   13. client developed homework assignments
   14. other (specify)_____
   15. other (specify)_____
   16. other (specify)_____
   17. other (specify)_____

6. How often are articulation cases seen each week?_____

   What is the average length of each session?_____

7. On the average, how many weeks of management are required before
   the client begins to produce sounds correctly in conversational
   speech in the clinic room?_____

   Until he incorporates them into his everyday speech?_____

8. What do you see as the major problem(s) in attaining carryover?

   _____

   _____

   _____

   _____

   _____

9. What would you like to tell me that I haven't asked?

   _____

   _____

   _____

   _____

   _____

                                        Thank you for your help!

                                        Joan Polson

APPENDIX C

COVER LETTER AND INFORMED CONSENT FORM

November 5, 1979

An important aspect of any speech/language program is carryover, the transfer of newly learned skills to all speaking situations outside the clinical setting. Your opinions and ideas concerning carryover in your articulation management program are important. Please share them by filling out the enclosed questionnaire. The results of this research will be the basis of my master's thesis currently in progress at Portland State University.

As a speech-language clinician in the public schools you were selected for participation in this study. In order that the results be truly representative of the views of public school clinicians, it is important that you complete and return this questionnaire. This study involves providing written responses to questionnaire items. The questionnaire itself takes about ten minutes to read and fill out. Your participation may help to increase knowledge which may be beneficial to others in the future.

You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that I may check your name off the mailing list when your questionnaire is returned.

I would be most happy to answer any questions you might have. Please write me at 4026 N.E. Davis, Portland, Oregon or call me collect at (503) 235-6963.

Thank you for your assistance.

Sincerely,

Joan Polson

I have read and understand the above information.

Signature:_____ Date:_____

If you have any questions about your participation in this study, please contact Richard Streeter, Office of Graduate Studies and Research, 105 Neuburger Hall, Portland State University, 229-3424.

APPENDIX D

FOLLOW-UP POSTCARD

Dear clinician,

Two weeks ago a questionnaire seeking your opinion on carryover practices in articulation management was mailed to you.

If you have already completed and returned the questionnaire please accept my sincere thanks. If not, please do so today. Because this questionnaire was sent to only a select sample of clinicians in Oregon it is extremely important that you be included in the study if the results are to accurately represent the opinions of public school clinicians in Oregon.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me collect at (503) 235-6963 and I will put another one in the mail to you today.

Thank you,