COMMUNICATION EFFECTIVENESS OF ARTICULATION IMPAIRED CHILDREN

A Thesis

Submitted to

the Faculty of the Graduate School

Appalachian State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

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May 1981

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Communication Effectiveness

of

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ABSTRACT

The purpose of this study was to determine if children with moderate articulation impairments communicate as effectively as normal speaking children.

Twenty-four public school children participated in a communication interaction activity. Twelve of the children were normal speaking and twelve were identified as having moderate articulation impairments.

The null Hypothesis of no significant difference in the speaking performance of normal speaking children and children with moderate articulation impairments was not rejected.

The null Hypothesis of no significant difference in the listening performance between children identified as having moderate articulation impairments and normal speaking children was rejected. Children with moderate articulation impairments seem to be less effective listeners than normal speaking children.

Acknowledgements

I would like to express my most sincere thanks to Mr. Ted Culler and Mrs. Betty Hensley, Charlotte-Mecklenburg School System, for their help in obtaining subjects and assisting in preparation for this study.

I wish to thank the 24 participants in the study, all students at Villa Heights Elementary School, Charlotte, North Carolina.

My special thanks go to Dr. Edward Hutchinson, for giving me time and the encouragement to complete this project. Special thanks also go to R. Jane Lieberman and Dr. William Blanton for their assistance.

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Chapter 1

INTRODUCTION

There is probably no activity more pervasive than communication, except for the biological processes that keep us alive (Burgoon, 1974). Communication, in any form, is necessary, not only to survive, but also for interaction as an integral part of society. According to Wood (1971), communication can be defined as:

> the process of imparting to one another ideas, thoughts, feelings or opinions by means of signs, signals, and symbols expressed consciously or unconsciously; a broader and more inclusive term than language and speech.(p. 10)

It is imperative that a person be able to communicate for building and maintaining relationships with other persons. Thus, communication calls for at least two active participants; it is not unidirectional (Muma, 1978).

The communication act involves two or more persons in which (a) the behavior of one (speaker) is directed toward the other (listener), (b) the listener's behavior is influenced by the speaker, and (c) the speaker's subsequent behavior is influenced by the response originally elicited (Glucksberg, 1975). Figure 1 presents a model of the communication process which may help in clarifying the above statements. The schema begins with the speaker who wishes to send a message to the listener.

To communicate this message (Message [1]), it must first be put into a code (the process of Encoding) which can be transmitted to the listener. The transmitted code is called the signal. When the listener receives the signal, the code must be deciphered (the process of Decoding) and the meaning must be extracted (Message [2]). The degree to which message [1] is congruent with message [2]) is a measure of the communication effectiveness of the speaker. (Borden, 1971, p. 5).

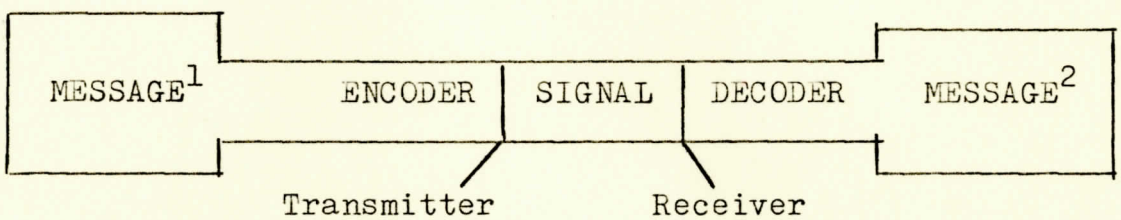

Figure 1

The Communication Process (Borden, 1971)

It is imperative to remember that in the communication process there will always be a sender, receiver, and a signal (Borden, 1971). Communication is the primary function of language; therefore, effective communication by both participants in the process is essential (Glucksberg and Danks, 1971).

Encoding involves the communicator's ability to understand "the communicative context in terms of actual and presumed reference" (Muma, 1978, p. 121) and to produce the intended message with regard for the listener's needs. Decoding involves interpreting the messages to distinguish the speaker's main intent. In a description of effective communication, Muma notes that "if the code is consistent with one's communicative intent, deals with available referents (actual or presumed), and is in an appropriate form, the decoder will be able to discriminate the meaning of an intended message" (p. 121).

Significance of the Study

Many researchers have studied children's communication abilities in terms of language and articulation (Vandemark and Mann, 1965, Shriner, 1969, Schneiderman, 1955), but there seems to be an absence of studies concerning the possible relationship between articulation impairments and communication effectiveness. According to one researcher,

children need to be articulate, at least moderately so, to communicate effectively (Rousey, 1972). A child's communication effectiveness can be examined in terms of how well an intended message is delivered and received, therefore, the purpose of this study is to determine if children with moderate articulation impairments communicate as effectively as normal speaking children.

Hypotheses

To facilitate the computation and analysis of the data, the hypotheses were stated in the null form, and were tested at the .05 level of significance.

Research Hypothesis

There is no significant difference between the communication effectiveness of normal speaking children and children with moderate articulation impairments as measured by a communication interaction activity.

For the purpose of this study communication effectiveness has been broken down into its two traditional components, speaking and listening.

Null Hypotheses

There are two null Hypotheses employed in this study.

Hypothesis 1. There is no significant difference in the speaking performance of normal speaking children and

children with moderate articulation impairments.

Hypothesis 2. There is no significant difference in the listening performance between children identified as having moderate articulation impairments and normal speaking children.

Definitions

Articulation--Production of speech sounds by the stopping or constricting of the vocalized or non-vocalized breath stream by movements of the lips, tongue, velum, or pharynx (Powers, 1972, p. 837).

Moderate Articulation Impaired Children--Children achieving a score between 16-24 on the Weighted Articulation Test (Ted Culler, 1980), used in the Charlotte-Mecklenburg School System.

Assumptions and Limitations

Assumptions

1. The statistical method employed (t test) is adequate.

2. The method employed for identifying articulation impaired and normal speaking children is adequate.

3. The figures used in the communication interaction activity are unfamiliar to all the children.

Limitations

1. The data are limited to the age group used in this study.

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

Chapter 2

REVIEW OF RELATED LITERATURE

In order to understand "communication effectiveness", several areas of relevance have been researched and reported through related literature: articulation impairments in relation to communication effectiveness; communication effectiveness in terms of various language skills and social relationships; the two-person communication game and related information.

Effective Communication

An Introduction to Articulation Impairments

According to Rousey (1972), speech refers to the sounds....which when used together results in the production of verbal language. Shriner, (1971) stated, speech is only one means of communication--the verbal output. A child should be articulate, at least moderately so to communicate effectively. For children with articulation impairments, speech may or may not be a problem depending on how effectively the child communication intended messages.

There are many disorders of speech which can be examined in terms of effective communication. The researcher felt the need to study articulation impairments, though, because "articulation problems have long been recognized as the most

prevalent of all disorders of speech" (Powers, 1972, p. 837). Also, Hahn (1960) stated communicative speech is important for articulation impaired children. They need to be able to express ideas and convey a meaningful message to the listener. Some children seldom feel a need to talk. Davis (1937) found that children with articulation impairments were more shy and negativistic than normal children and rated lower on "talkativeness" and "spontaneity".

Articulation Impairments as Compared to Language Skills

Research shows that children impaired in articulation skills are also impaired in other communication skills, e.g., language. Vandemark and Mann (1965) conducted a study of oral language skills on a group of normal-speaking children and a group of articulation-impaired children. The only difference found between the two groups was structural complexity. Children with impaired articulation were found to be weaker in this area. Mean length of response, standard deviation of response length, number of one word responses, mean of the five longest responses, number of different words and type-token ratio showed no significant differences. Shriner (1969) found that children with articulation impairments did not perform as well as normal speaking children in the area of grammatical completeness, but according to this researcher "very little is known about the expressive language of children with severe articulation problems" (p. 320).

Saxman and Miller (1973) have stated that children with articulation impairments performed less well than normal speaking children on a sentence recall test. Emerick (1979), Powers (1972), Cohen and Diehl (1963) support research which showed children with severe articulation impairments as having more errors in speech sound discrimination.

Further research studying the relationship between speech and vocabulary, and speech and reading achievement resulted in no significant findings (Powers, 1971). Carrell and Pendergast (1954) have reported that there is no significant difference between a group of normal-speaking children and articulation-impaired children in spelling ability or in the types of spelling errors which occurred.

Children deficient in articulation skills also show deficiencies in some language skills. The research, though, does not indicate any pattern of deficiency in any one area of language. Therefore, it cannot be assumed that articulation impairments and weaknesses in language skills are directly related.

Articulation Impairments and Social Relationships

Several researchers have examined articulation impairments in terms of social relationships. According to Lerea and Ward (1966) the speech-handicapped child is hindered in social adjustment and usually experiences less from interpersonal relationships than normal-speaking friends.

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Articulation Impairments and Social Relationships

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Brissey and Trotter (1955) conducted an experiment among speech-impaired children and found that "the subjects appeared not to be importantly influenced by speech defectiveness or its influence on communication when making the following choices: (1) the boy you would most likely eat with; (2) the boy you would most likely room with....(3) the boy you would most like to talk to" (p. 278). The researchers in this experiment concluded that peer preferences are not related to the severity of the child's speech problems.

The Two-Person Communication Game

Referential Communication

Many studies have been conducted with the two-person communication game. The activity referred to here involves pairs of individuals interacting by describing abstract figures to each other. The speaker describes a particular figure and the listener is expected to choose the described figure from a set of similar figures. An example of the two-person communication game can be found in Figure 2. Much of the research has been concerned with referential communication. The following paragraph serves as a basic introduction to referential communication:

> If language were a code, such that each object, event, or relationship referred to had a unique "name", then the problem of choosing a word or utterance would be reduced to determining the

> particular associations between referent, the things referred to, and their names. This, however, is not so. Referents (i.e., objects, events or relations) and their names do not have simple one-to-one correspondence..... In general, a listener is said to understand a speaker if he can correctly discriminate the referent from a set of nonreferents on the basis of a message supplied by the speaker. (Glucksberg and Krauss, 1975, p. 309)

In a study by Glucksberg and Krauss (1966), findings on referential communication in nursery school children, four to five years old, indicate they are unable to play the communication game effectively with novel graphic designs. When given more familiar designs, though, the children were successful. Three to four year old children could not communicate effectively with either designs, novel or familiar. An example of the novel graphic designs used in the previous study and many of the related studies is found in Figure 3 (Krauss and Weinheimer, 1964).

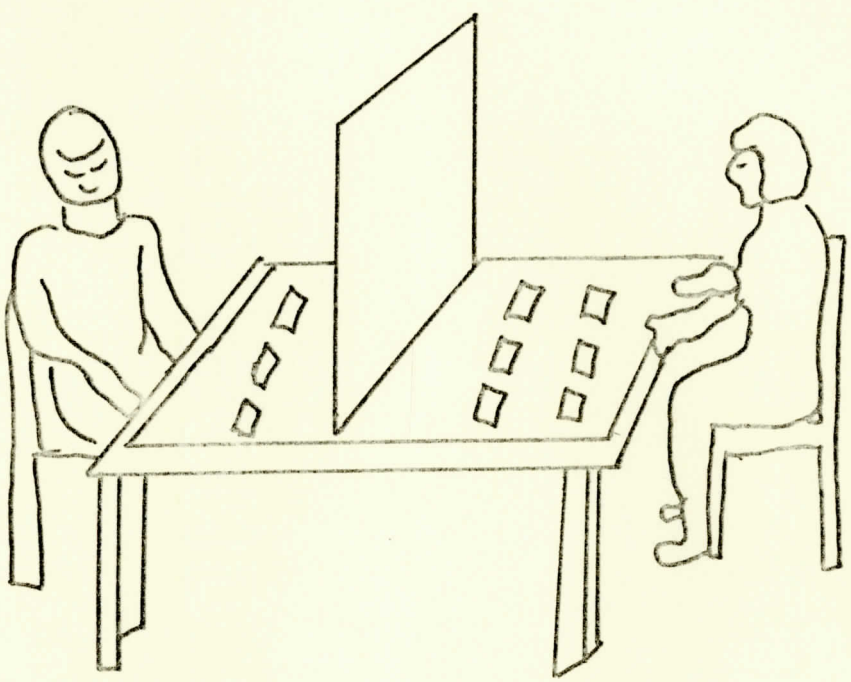

Figure 2

The Two-Person Communication Game

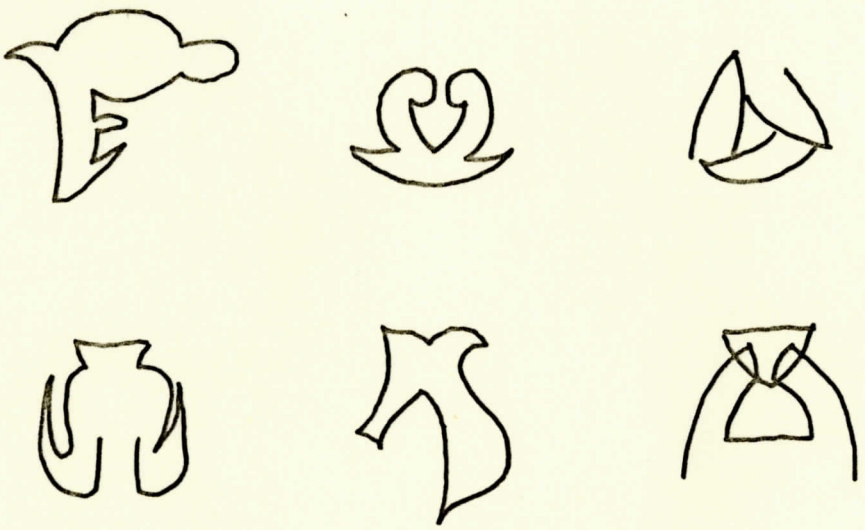

Figure 3

Novel Graphic Designs

As stated by Muma (1978), being an effective communicator involves much more than just sending and receiving a message. Both speaker and listener are active participants in the process. The speaker must be able to transmit codes appropriately while the listener must be able to receive the codes appropriately. In Peterson's view (1972), role-taking is also a necessary part of effective communication. The speaker should be able to play both roles (speaker and listener) so that when the message is delivered, the needs of the listener are also met.

Krauss and Glucksberg (1969) studied referential communication in kindergarten, first, third, and fifth grades. While first, third, and fifth graders showed improvement over several trials, children in kindergarten showed none, suggesting that there are differences in communication effectiveness as a function of age. The data indicated that communication proficiency increases in relation to the age of the speaker-listener pair.

In support of the previously mentioned findings, Muma (1978) stated that as children become older they begin to realize that the only way to be effective communicators is to include all participants in the process. They recognize that a listener is not only for talking but is helpful in locating the signal most appropriate for the situation.

Krauss and Weinheimer (1966) conducted a study with

adults, looking at concurrent feedback and the encoding of referents in verbal communication. They concluded from the data that concurrent feedback was found to have a great effect on encoding and the speakers tended to reduce the length of their phrases with concurrent feedback over repeated trials.

Communication effectiveness in terms of socially and nonsocially encoded messages was studied by Krauss, Vivekananthan, and Weinheimer (1968), who defined communication effectiveness as the "accuracy with which a message enables a listener to select an object from a set of objects" (p. 296). They found that names which have been socially encoded (described for someone else), elicit more accurate identification than names which have been encoded nonsocially (messages which speaker describes for self). The researchers made an interesting observation. A person usually encodes information for personal use in a different way than information intended for another person. Jean Piaget's research supports this notion as he recognized the concept of egocentrism in young children, i.e., "egocentricity precludes children from taking the listener into account in a speaking situation" (Bloom and Lahey, p. 217).

The research on referential communication supports the notion that effective communication requires two active participants (the speaker and listener). The research also

suggests communication effectiveness increases with age and varies according to the speaker-listener pair. For purposes of this study, the speaker and listener scores will be compared to determine if there is a significant difference in the communication effectiveness of normal speaking children and children with moderate articulation impairments.

Influences of Status and Age

Krauss and Rotter (1968) examined communication effectiveness in relation to status and age. Employing the six novel designs seen in Figure 3, they found that middle status subjects are superior to lower class subjects as both speakers and listeners. Communication appeared to be more effective between members of the same status groups than between different groups.

In a study of three class groups (lower, middle, and upper) by Harms (1961), speakers tended to get more response from listeners in the same class. Also, lower-class listeners understood lower-class speakers better than middle-and upper-class speakers.

The communication interaction activity in this chapter has been discussed in reference to two participants, a speaker and listener. For purposes of this study a variation of the two-person communication game has been used to determine if there is a significant relationship between articulation impairments and communication effectiveness. The

children in this study were taken in groups of six, where one child served as speaker, and the other five children served as listeners. Each child in the group had the opportunity to be the speaker once and listener five times. Further discussion of the variation of the two-person communication game used in this study can be found in Chapter 3.

Research indicates there are many factors influencing communication effectiveness, e.g., age of the participants, concurrent feedback, social encoding of the message, and influences of status and age. There is no evidence showing an increase or decrease in communication effectiveness as a result of articulation impairments.

Chapter 3

PROCEDURES

Participants in the Study

The subjects used in this study were 24 seven year old public school children selected from the Charlotte-Mecklenburg School System. Twelve of the children were identified as having moderate articulation impairments and twelve of the children were identified as normal speaking children. The moderate articulation impaired children were identified by the Weighted Articulation Test (Ted Culler, 1980) used in the Charlotte-Mecklenburg School System. The normal speaking children were randomly selected by their classroom teachers.

Test Instruments

Administration of the Weighted Articulation Test

The Weighted Articulation Test (WAT), developed in the Charlotte-Mecklenburg School System, consists of 12 plates, with pictures to evaluate production of vowels and consonants in words and sentences (an example of the entire test can be found in Appendix A, including instructions to the clinician for administration and scoring).

The children, identified as having moderate articulation impairments, had to achieve a score of 16-24 on the WAT. These children were tested and identified by the speech

clinician at their elementary school during the school year of 1980.

Administration of the Communication Interaction Activity

The children were randomly divided into 4 groups of six, with three moderate articulation impaired and three normal speaking children in each group. One child was randomly designated as speaker while the five other children served as listeners. The speaker was given three stimulus items (abstract monster figures--see Appendix B) to describe to the listeners. These figures were modified from those which appeared in Concepts For Communication (1972). The five listeners were given one score sheet for each stimulus (a total of three) and a crayon to mark with. The speaker was instructed to describe the first "monster picture" to the listeners. The listeners were not allowed to ask questions and could not look at the speaker. The speaker and listeners were divided visually by an opaque screen to assure that no visual clues were exchanged between them. After the speaker described the first picture to the group, the listeners were instructed to mark the picture they thought the speaker was talking about. Each picture was marked with a large X across it. The speaker was then instructed to describe picture 2 and 3. After the first 3 pictures were described, the score sheets were collected and the children rotated so that there was a new speaker. The

listeners were then given a different set of score sheets and the next speaker described a new set of pictures. Each child had a turn at speaking once on two occasions and served as listener five times on two occasions. There were six sets of different stimulus items. These were rotated in each set so that no child described the same pictures twice.

Each child received a speaker score and a listener score. The speaker score was determined by how well the listeners received the speaker's message. If a majority of the listeners marked the correct picture (at least 3) the speaker received one point. The listener received a point for marking the correct picture. The speaker could receive a maximum of 3 points, while the listener could accumulate as many as 15 points. A set of marked pictures is found in Appendix B.

Statistical Method

The two-tailed t test for independent means (Bruning and Kintz, 1968) was employed to determine the difference between the performance of articulation impaired children and normal speaking children while participating in the communication interaction activity.

Chapter 4

RESULTS

The raw scores obtained from the children in the communication interaction activity are summarized in Tables 1 and 2. The mean scores for each of the groups were: Normal Speaking, 4.8; Articulation Speaking, 5.0; Normal Listening, 23.25; Articulation Listening, 20.75.

The performance of the children in the two groups was tested by employing the t test. These results are found in Table 3. While the results of the t test ($t = .4$) suggest no difference in speaking scores of the two groups of children, the results ($t = 2.7$, $p < .05$) do suggest a difference in the listening scores. The children with moderate articulation impairments seem to be less effective listeners than the normal speaking children.

Research Hypothesis

There is no significant difference between the communication effectiveness of normal speaking children and children with moderate articulation impairments as measured by the communication interaction activity.

Null Hypotheses

There were two null subhypotheses employed in this study.

Table 1

Results of the Communication
Interaction Activity-Speaking Scores

Normal Speaking Score			Articulation Speaking Score		
Group 1N*			Group 1A*		
1st day	2nd day	Total	1st day	2nd day	Total
3	2	5	3	3	6
2	3	5	2	3	5
3	3	6	2	3	5
Group 2N			Group 2A		
3	3	6	2	3	5
3	3	6	2	3	5
3	3	6	3	3	6
Group 3N			Group 3A		
3	3	6	1	3	4
2	2	4	3	3	6
3	3	6	1	2	3
Group 4N			Group 4A		
0	0	0	0	2	2
3	2	5	3	3	6
1	2	4	3	3	6
Mean = 4.8			Mean = 5.0		

*1N--1st Group Normal Speaking Children
1A--1st Group Articulation Impaired Speaking Children
2N--2nd Group Normal Speaking Children
2A--2nd Group Articulation Impaired Speaking Children
3N--3rd Group Normal Speaking Children
3A--3rd Group Articulation Impaired Speaking Children
4N--4th Group Normal Speaking Children
4A--4th Group Articulation Impaired Speaking Children

Table 2

Results of the Communication
Interaction Activity-Listening Scores

Normal Listening Score			Articulation Listening Score		
Group 1N*			Group 1A		
1st day	2nd day	Total	1st day	2nd day	Total
14	11	25	10	10	20
14	8	22	13	7	20
10	11	21	11	11	22
Group 2N			Group 2A		
10	15	25	11	15	26
12	15	27	12	15	27
13	15	28	12	15	27
Group 3N			Group 3A		
9	15	24	9	8	17
12	15	27	11	9	20
9	13	22	9	12	21
Group 4N			Group 4A		
9	11	20	7	6	13
7	9	16	7	8	15
10	12	22	8	13	21
Mean = 23.25			Mean = 20.75		

*1N--1st Group Normal Children
1A--1st Group Articulation Impaired Children
2N--2nd Group Normal Children
2A--2nd Group Articulation Impaired Children
3N--3rd Group Normal Children
3A--3rd Group Articulation Impaired Children
4N--4th Group Normal Children
4A--4th Group Articulation Impaired Children

Table 3

Results of the t tests

Comparing Speaking & Listening Performance

Comparison	Articulation Impaired	Normal	t	df	Significance
Speaking	Mean = 5	Mean=4.8	.4	11	N.S.
Listening	Mean = 20.75	Mean=23.25	2.7	11	*P $<$ .05

*$P_{.05}$ = 2.201

Null Hypothesis 1. There is no significant difference in the speaking performance of normal speaking children and children with moderate articulation impairments.

According to the data presented in Table 2, null hypothesis 1 was not rejected, indicating no significant difference between the speaking performance of the two groups in the communication interaction activity.

Null Hypothesis 2. There is no significant difference in the listening performance between children identified as having moderate articulation impairments and normal speaking children.

According to the data presented in Table 2, null hypothesis 2 was rejected, indicating a significant difference between the listening performance of the two groups in the communication interaction activity.

Chapter 5

CONCLUSIONS

The results of this study suggest a difference in listening skills between normal speaking children and children with moderate articulation impairments. The moderate articulation impaired children exhibited significantly poorer listening skills than normal speaking children. Further research should be conducted to determine if there actually is a discrepancy in the listening skills of these two groups of children. There is a need for additional studies similar to this one to verify these results. Another possible study would be to determine if there is a significant correlation between severity of problem and accuracy of listening skill. For example, would children with mild articulation impairments exhibit mild listening problems, and children with severe articulation impairments exhibit severe listening problems?

The speaking scores between the two groups on the communication interaction activity were similar. The children in these two groups assumingly knew each other, and possibly were able to translate each other's descriptions of the abstract figures. It would be interesting to conduct research to determine if familiarity between speaker and listener produces the ability to translate. The research

could be conducted in such a way that two groups be used, one in which there is a high level of familiarity between the speaker and listener, and one in which the speaker and listener are not familiar with each other.

Although the area under investigation in this study was communication effectiveness, the task employed was restrictive in that the children were participating in a limited receptive task. They were not given the opportunity to initiate any conversation and were required to listen to the signals from the speaker. It would be interesting to examine what would happen if these children were given more opportunity to express themselves both through sending and receiving messages. The children should be observed, in their classrooms, to determine if articulation impaired children initiate conversations with their peers and are receptive to activities surrounding them. In this study, a verbal response was required of the children, but perhaps in a less restrictive environment they are not as willing to communicate. In other words, they can apparently communicate equally with normal speaking children when required to do so, but may not use communication skills as openly as normal speaking children when given a choice. If this assumption is true, articulation impaired children may need some form of stimulation to improve both speaking and listening skills.

If articulation impaired children are less communicative in the classrooms as compared to normal speaking children, their level of communicativeness may vary as a function of age. As children become older, are they more inhibited by their speech impairments due to social pressures? An interesting area of further study would be to examine communication effectiveness in third graders and eigth graders. A similar study could be conducted to examine the preferred communication partners of articulation impaired children. Do they tend to initiate conversation primarily with other speech impaired children; adults; or is there any pattern in their choice of partners?

The children in this study were separated visually by an opaque screen so that nonverbal cues would not influence the listeners. Nonverbal signals are another aspect of the communication process to consider in this area of research. The use of nonverbal cues in a similar communication interaction activity involving similar groups of children should be examined to determine if articulation impaired children become more efficient listeners with the help of supplemental signals. Perhaps articulation impaired children need to rely on nonverbal cues because their listening skills are not adequate to decode the message based on auditory cues alone.

Several explanations support the assumptions that

moderate articulation impaired children may not have been rewarded for exhibiting good listening skills when they were younger. If these children indeed were not rewarded for listening, they may have developed into poor listeners. As poor listeners they were turned off to communication and ignored models for correct speech production and became poor producers of speech. It would be interesting to examine early listening behaviors of children who later develop articulation impairments to determine if there is a link between early listening skills and articulation impairments.

Listening training is an important aspect that should be considered as a major part of therapy. Perhaps if therapy for children with articulation impairments began with training of listening skills, the production skills would not need to be trained or at least not as extensively. According to Emerick and Hatten (1979) "speech clinicians have persistently relied on 'ear training' in therapy because they strongly believe that the ear must discriminate before the mouth can articulate" (p. 145).

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APPENDIXES

INSTRUCTIONS FOR ADMINISTERING WEIGHTED ARTICULATION TEST

1. Show each test item picture and transcribe the examiner's response under "word resp." Put a plus (+) beside each error response.
2. All sentence items should be presented as sentence repetition tasks. On items 55 and 62 have examiner repeat only the second sentence.
3. After administering the entire test, go back to each item on which there is an error. Present the test sound in a schwa syllable. Give minimal phonetic placement cues. Transcribe response under "stim. resp." Put a plus (+) beside each error response. Stimulation for vowel test sounds should be presented in isolation.
4. For each test item, count the number of uses. If an item has one plus, the score will be the same as the point value indicated in the "wt. stim." column. If an item has two pluses, the score will be the same as the point value indicated in the "wt. non. stim." column.
5. Add scores together to determine total score and determine whether the problem is a "mild deviation", "moderate deviation", or a "disorder".

WEIGHTED ARTICULATION TEST

Name _____

School _____

Date _____ Age _____

Test Word	wt. non. st.	wt. stim.	word resp.	stim. resp.	score
1. bed	2	1			
2. balloon	2	1			
3. coat	2	1			
4. eight	2	1			
5. cow	2	1			
6. kite	2	1			
7. bat	2	1			
8. one	2	1			
9. ball	2	1			
10. pig	2	1			
11. key	2	1			
12 sock	2	1			
13. book	2	1			
14. shoe	2	1			
15. boy	3	1			
16. web	2	1			
17. doll	5	2			
18. bed	2	1			
The boy played with the ball.	1	1			
19 finger	3	1			
20. roof	2	1			
21 gun	5	2			
22. bag	2	1			
23. hat	3	1			
24. jar	3	1			
25. cage	2	1			
26 cat	5	2			
27. cake	2	1			
28. lamp	5	2			
29. nail	2	1			
30. mop	3	1			
31. comb	2	1			
32 nurse	5	2			
33. bone	2	1			
34. pot	3	1			
35. cup	2	1			
36. table	5	2			
37. boat	2	1			
The man washed my car.	1	1			
38. valentine	3	1			
39. stove	2	1			
40. wagon	3	1			
41. yo-yo	3	1			
42. thumb	3	1			
43. teeth	2	1			
44. this	3	1			
45. plate	3	1			
46. whistle	2	1			
47. ring	2	1			
The boy is walking.	1	1			
48. rabbit	5	2			
49. broom	3	1			
50. bird	1	.5			
51. fork	1	.5			
52. ear	1	.5			
53. star	1	.5			
54. chair	1	.5			
55. ladder	2	1			
This dog is big. This dog is even bigger.	1	1			
56. sun	4	2			
57. house	2	1			
Here are two cats.	1	1			
58. zipper	2	1			
59. hose	2	1			
Here are two bees.	1	1			
60. spoon	2	1			
61. snake	2	1			
62. nest	2	1			
This dog is bigger, but this dog is the very biggest.	1	1			
63. shirt	3	1			
64. fish	2	1			
65. chair	3	1			
66. watch	2	1			

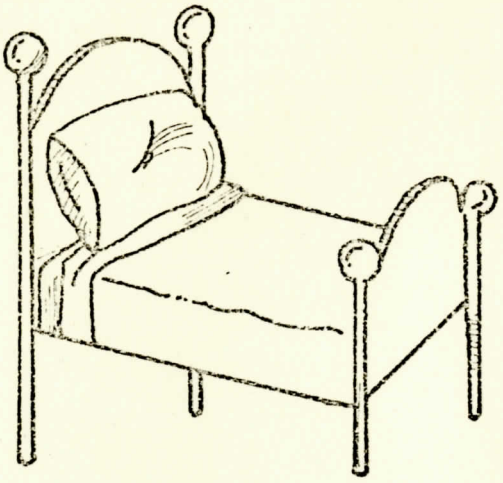
Interpretation of total score

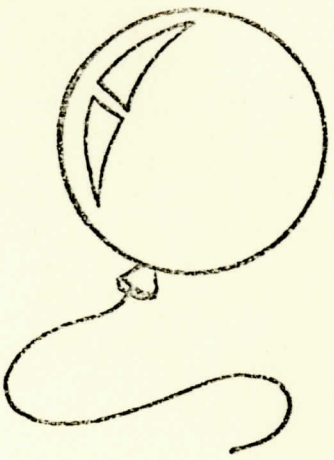
5 – 15 mild deviation

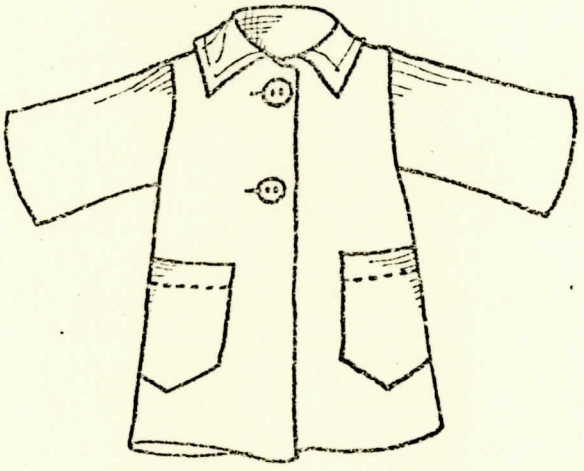
16 – 24 moderate deviation

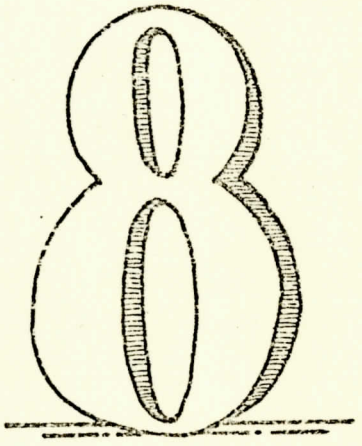
25 – disorder

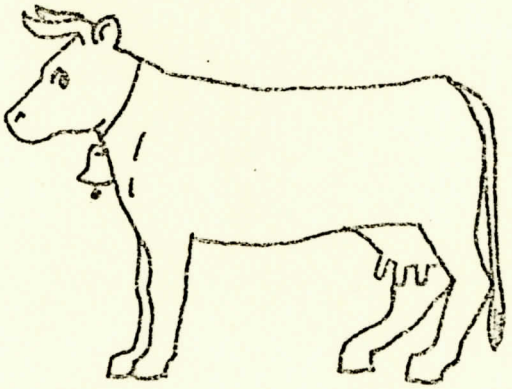
Ted Culler

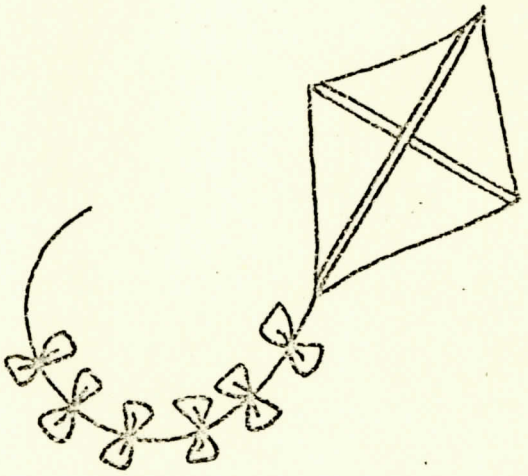


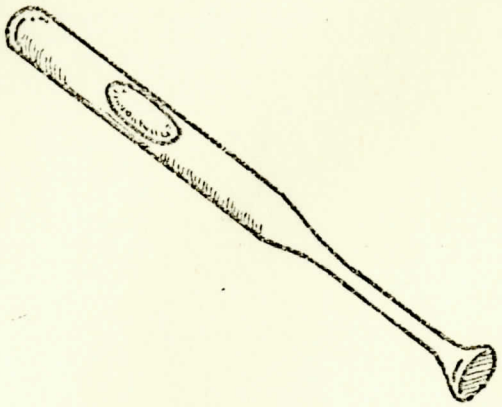


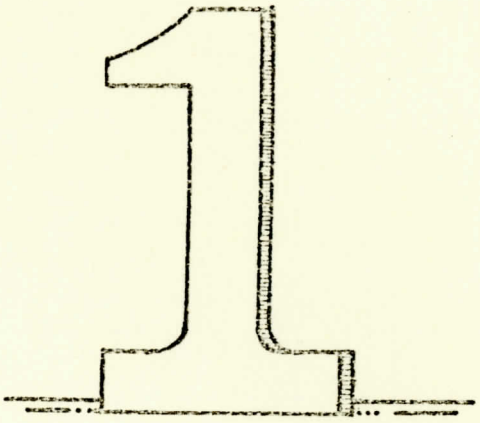


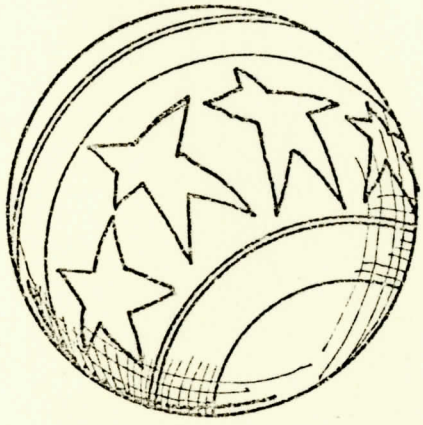


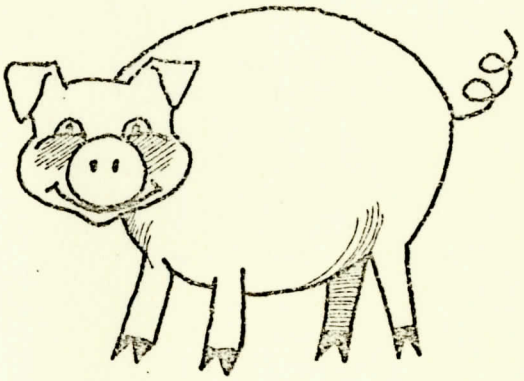


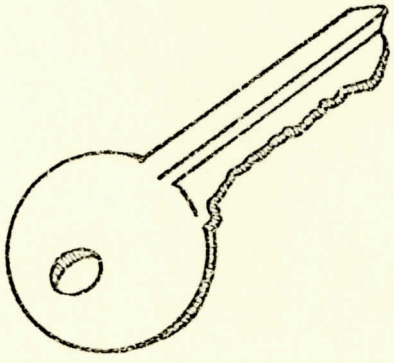


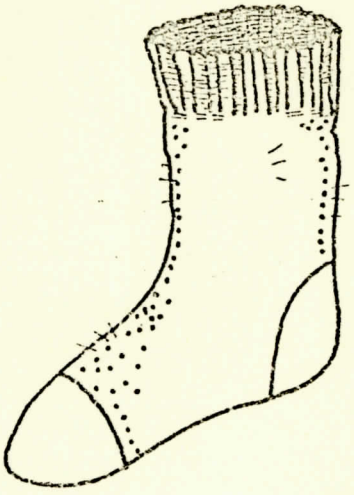


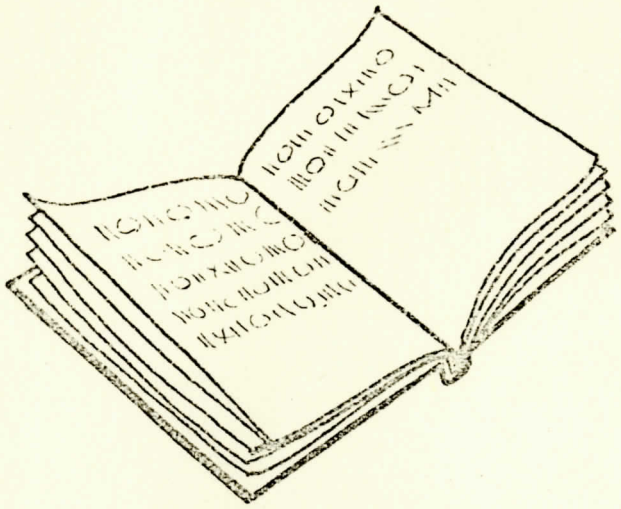


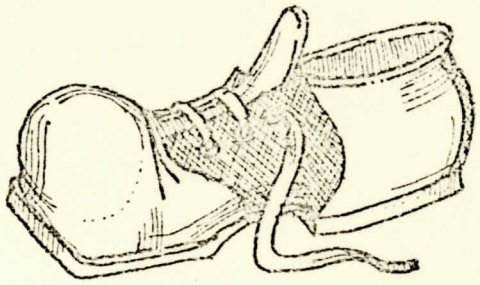


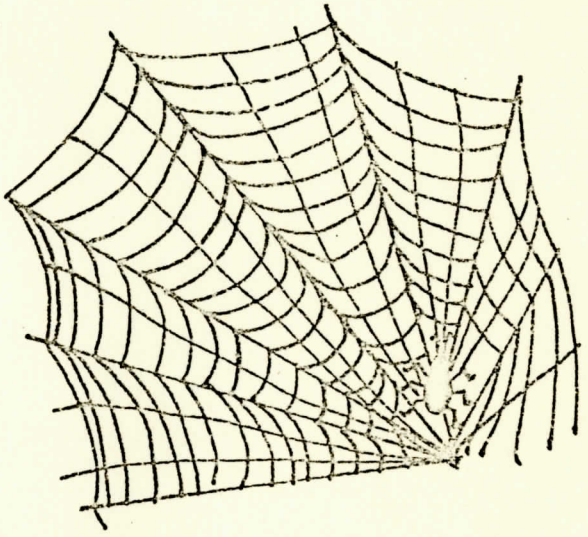


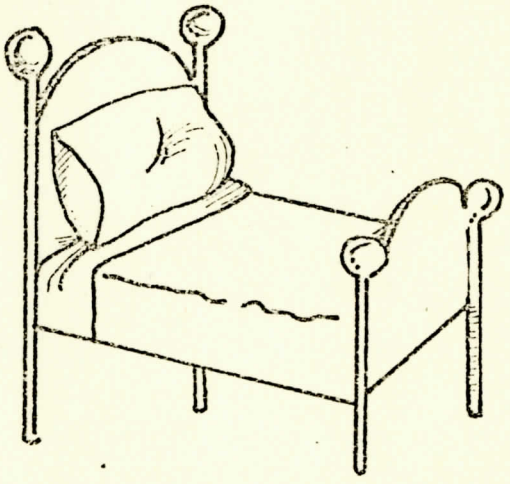


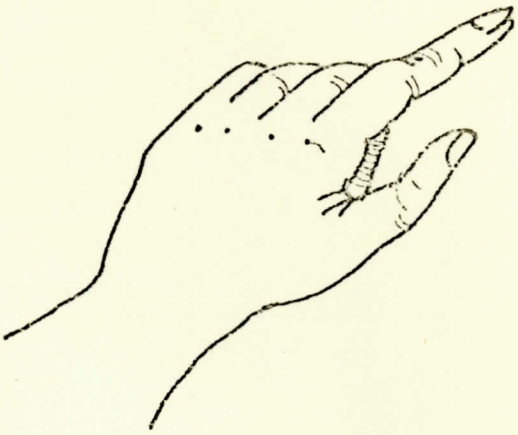


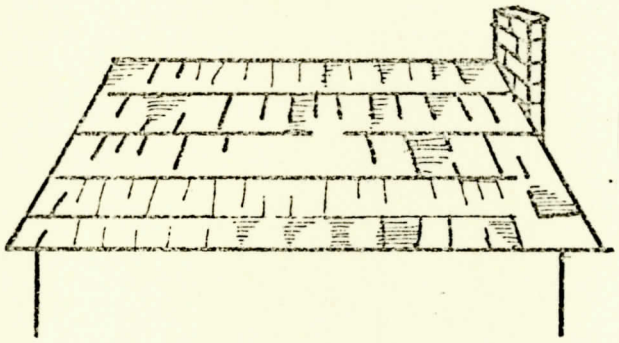


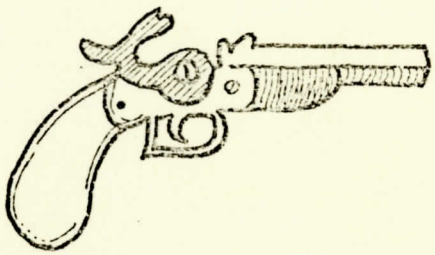


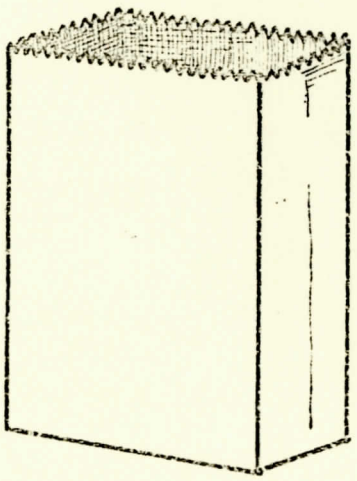


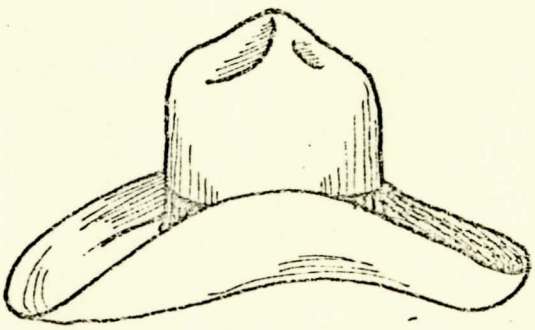


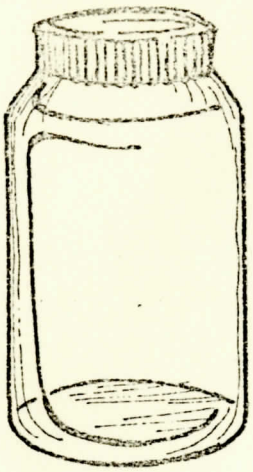


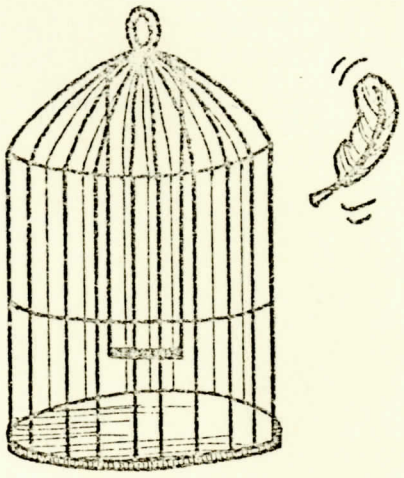


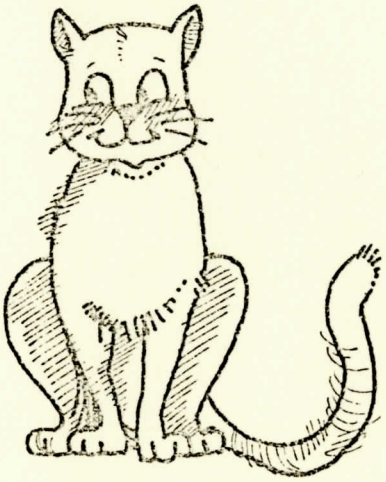


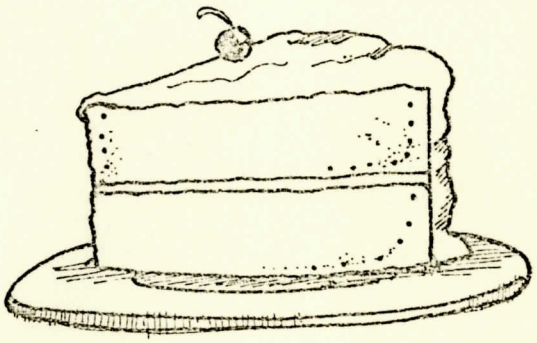


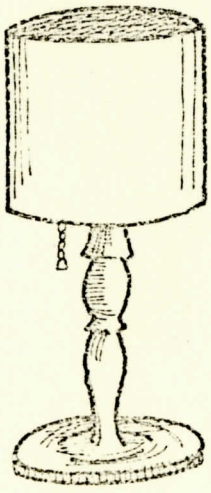


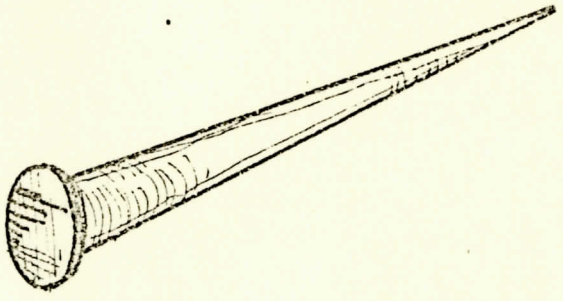


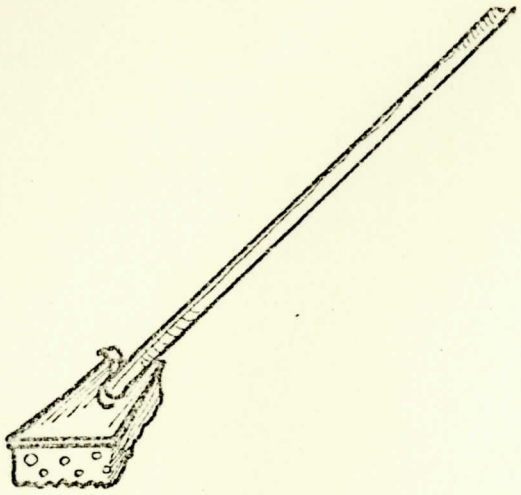


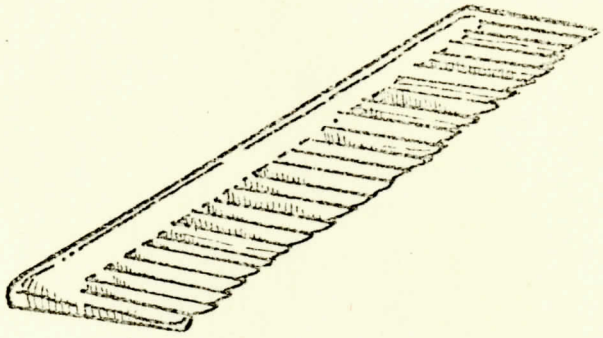


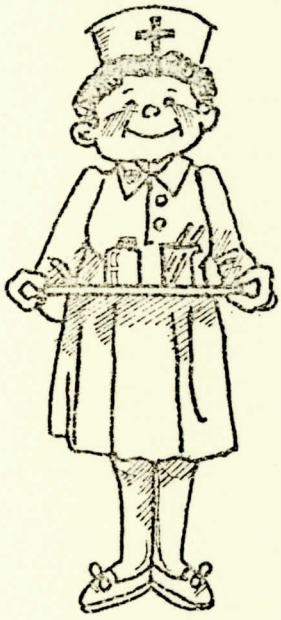


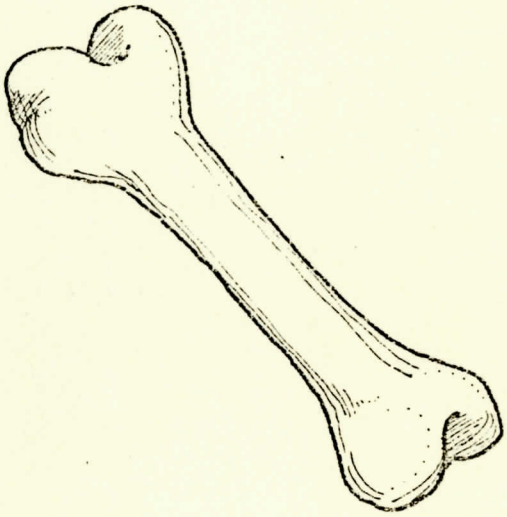


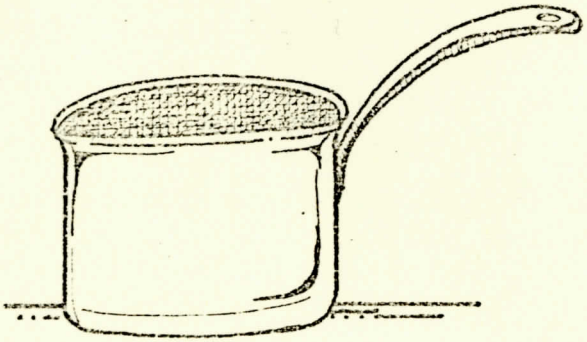


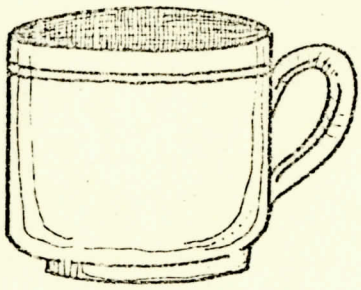


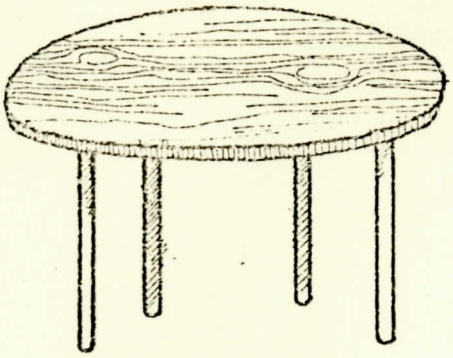


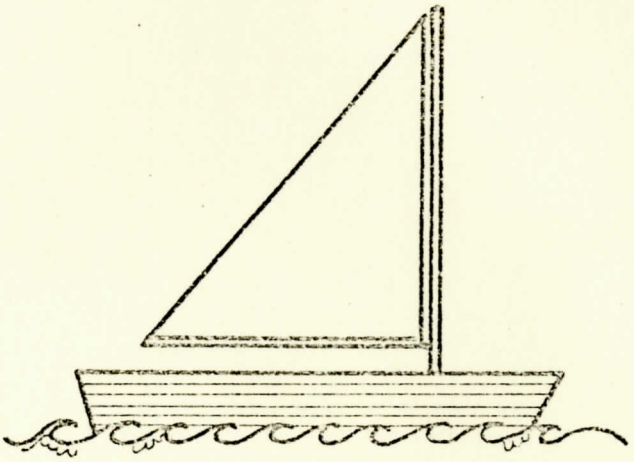


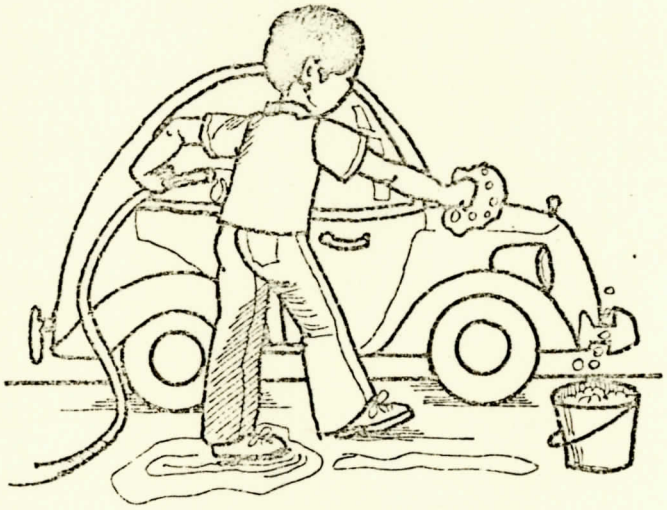




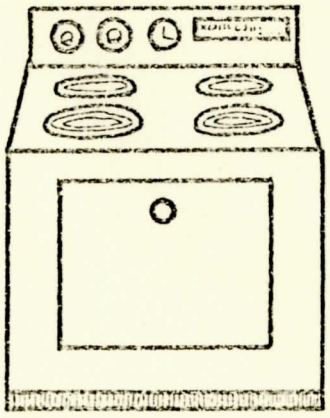


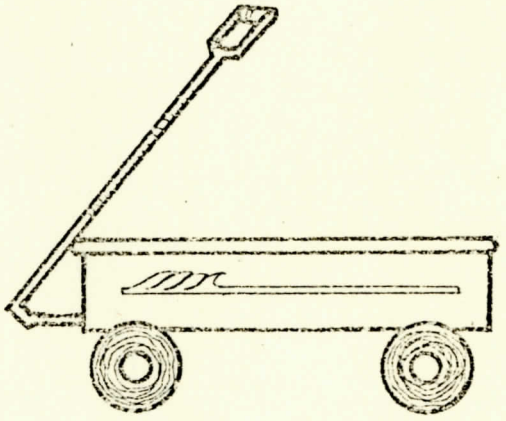


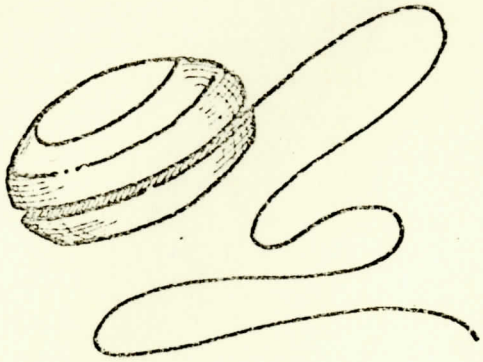


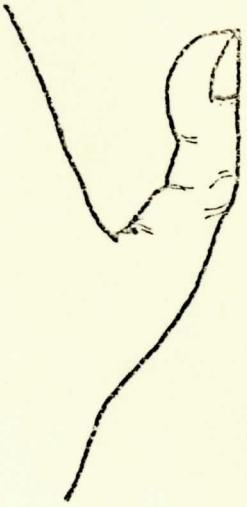


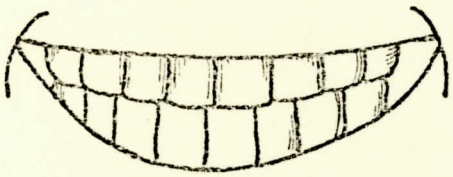

BE
MINE











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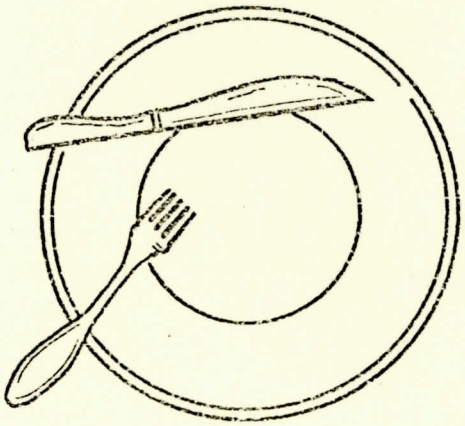

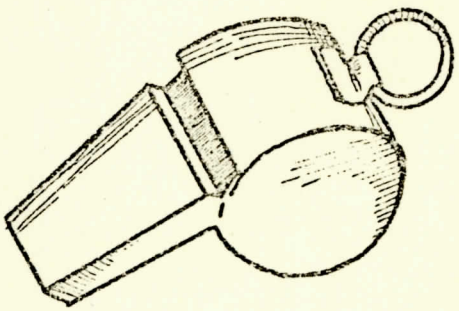

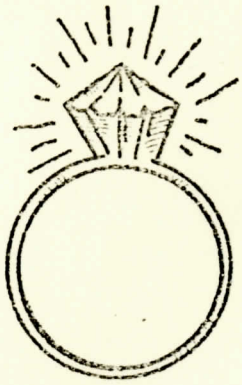

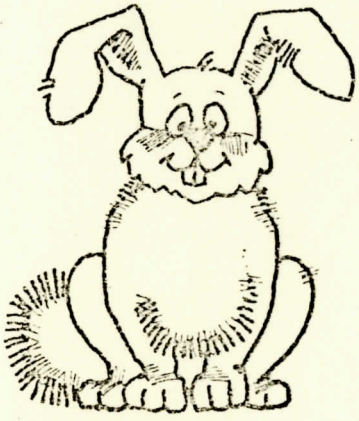

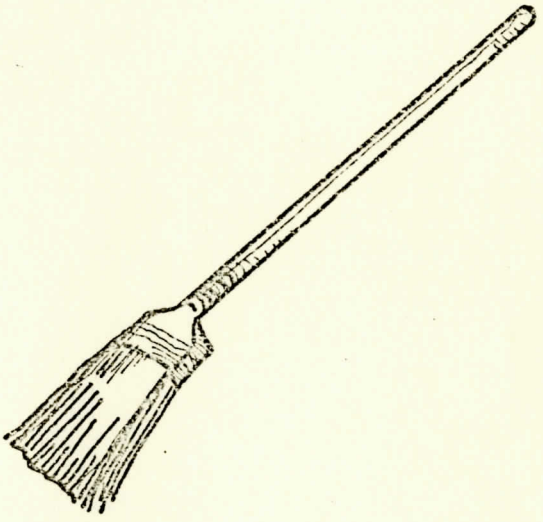

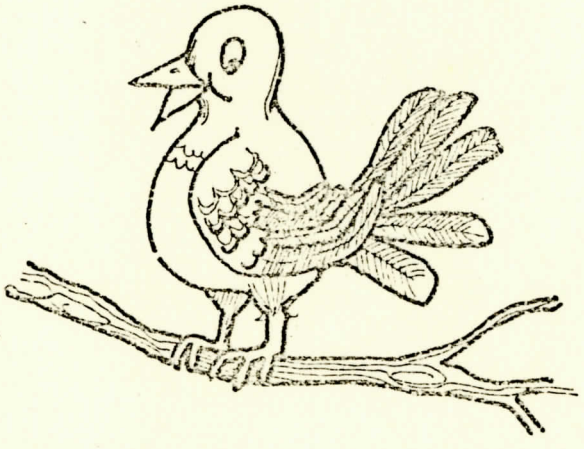

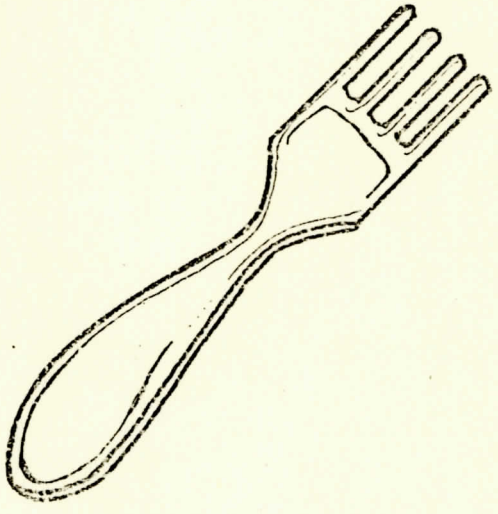

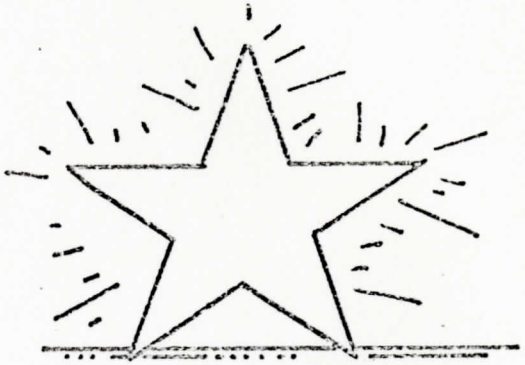

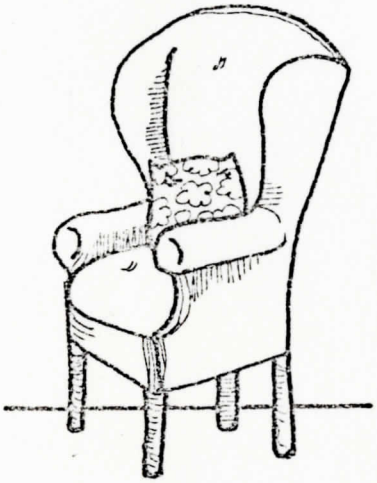

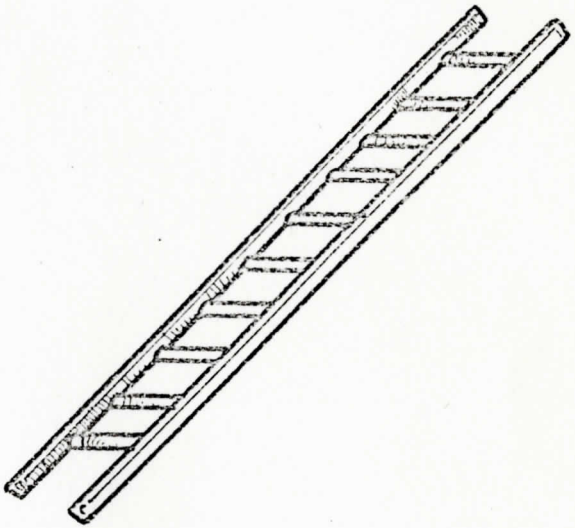

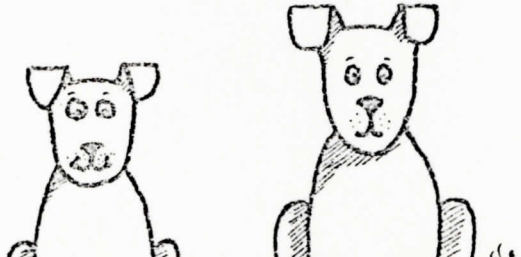

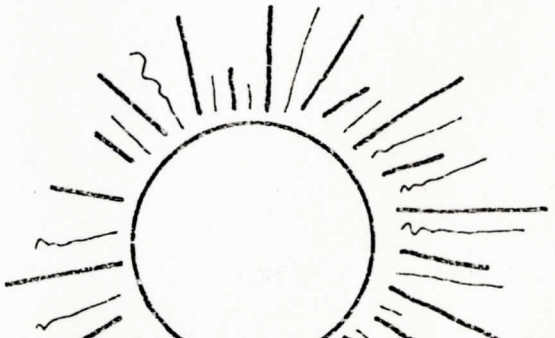

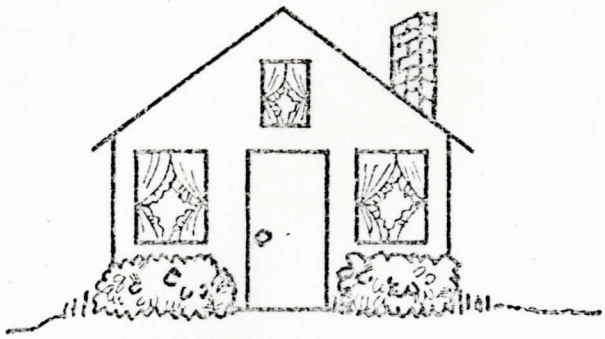

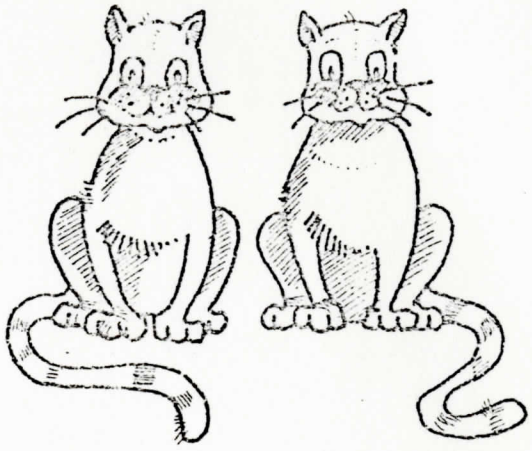

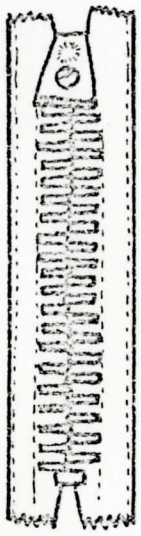

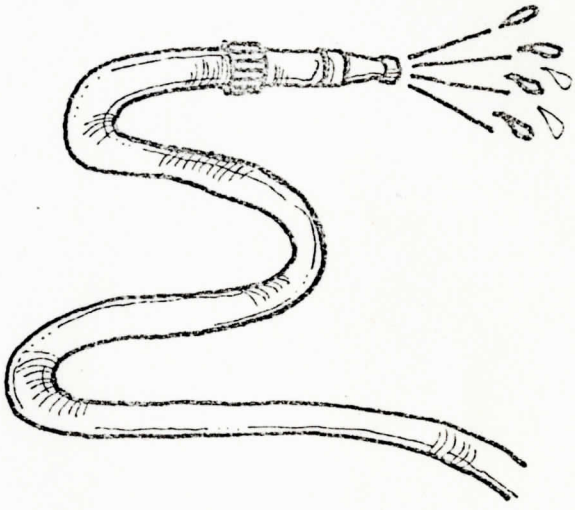

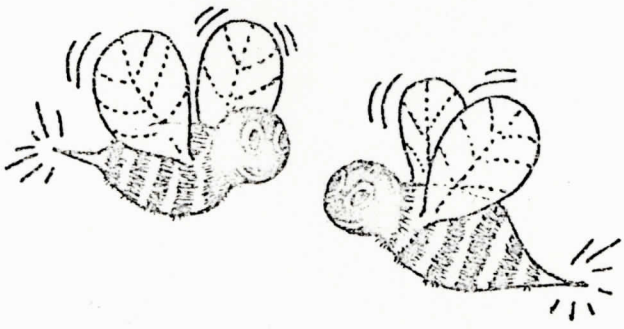

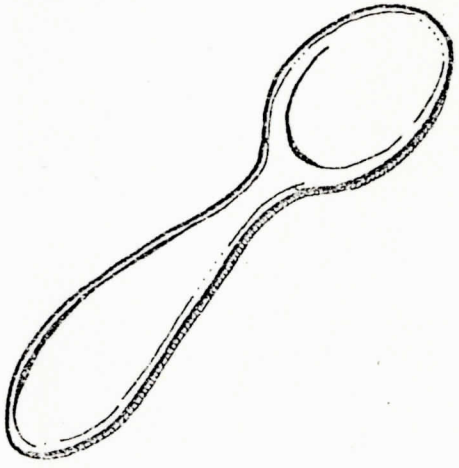

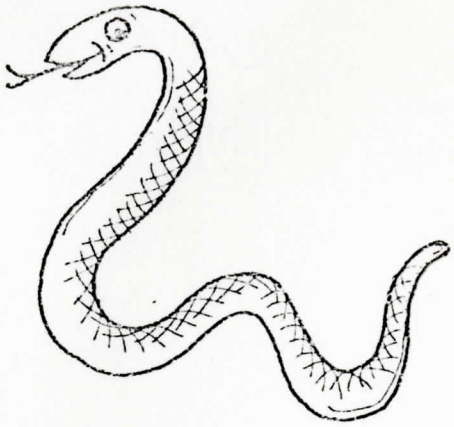

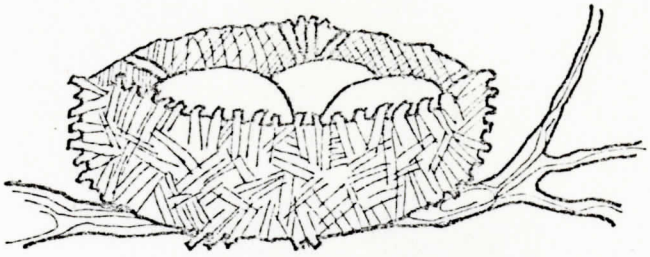

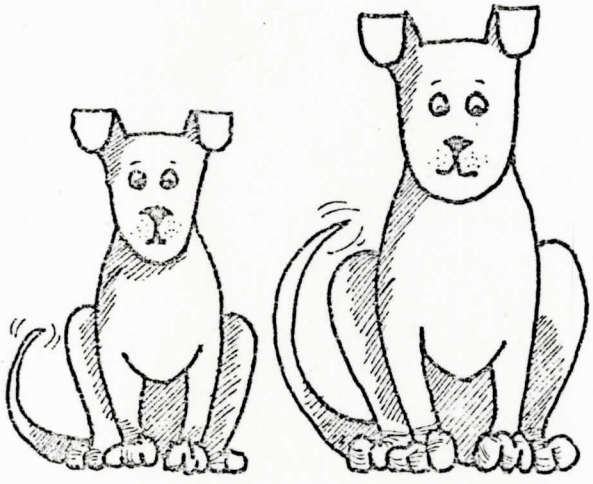


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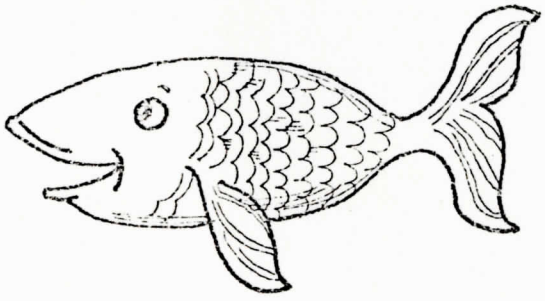
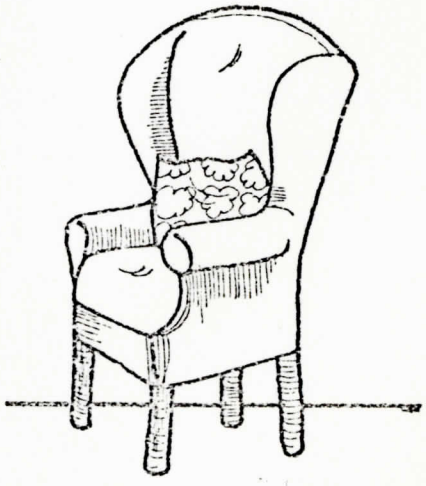
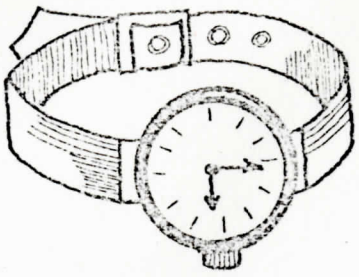
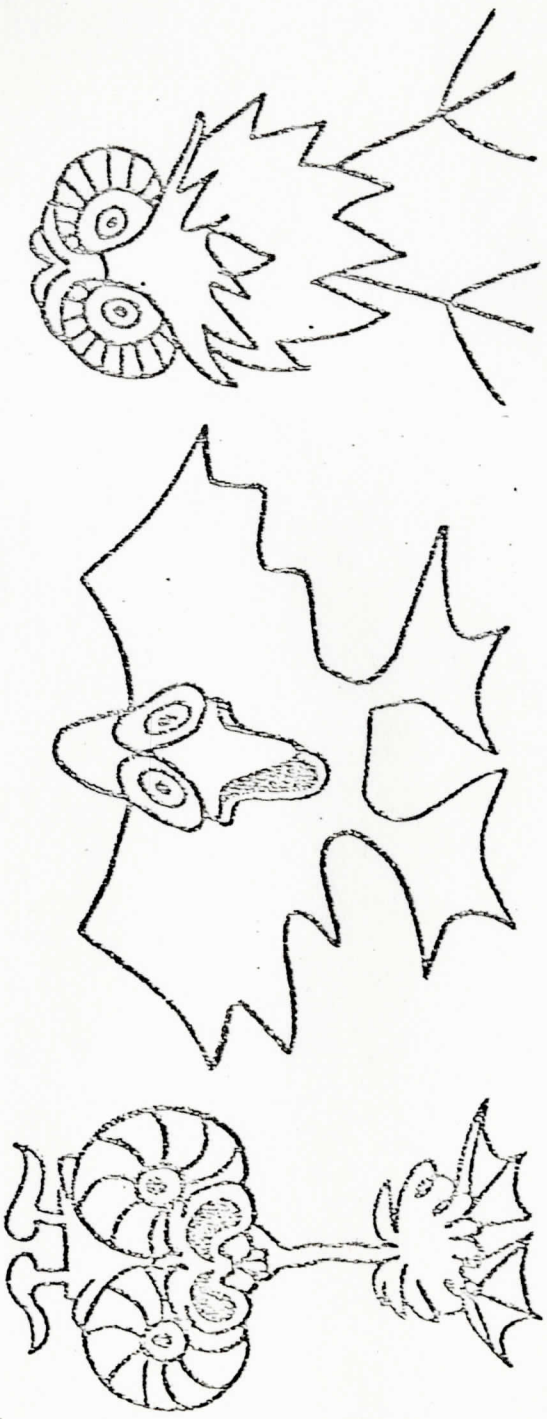


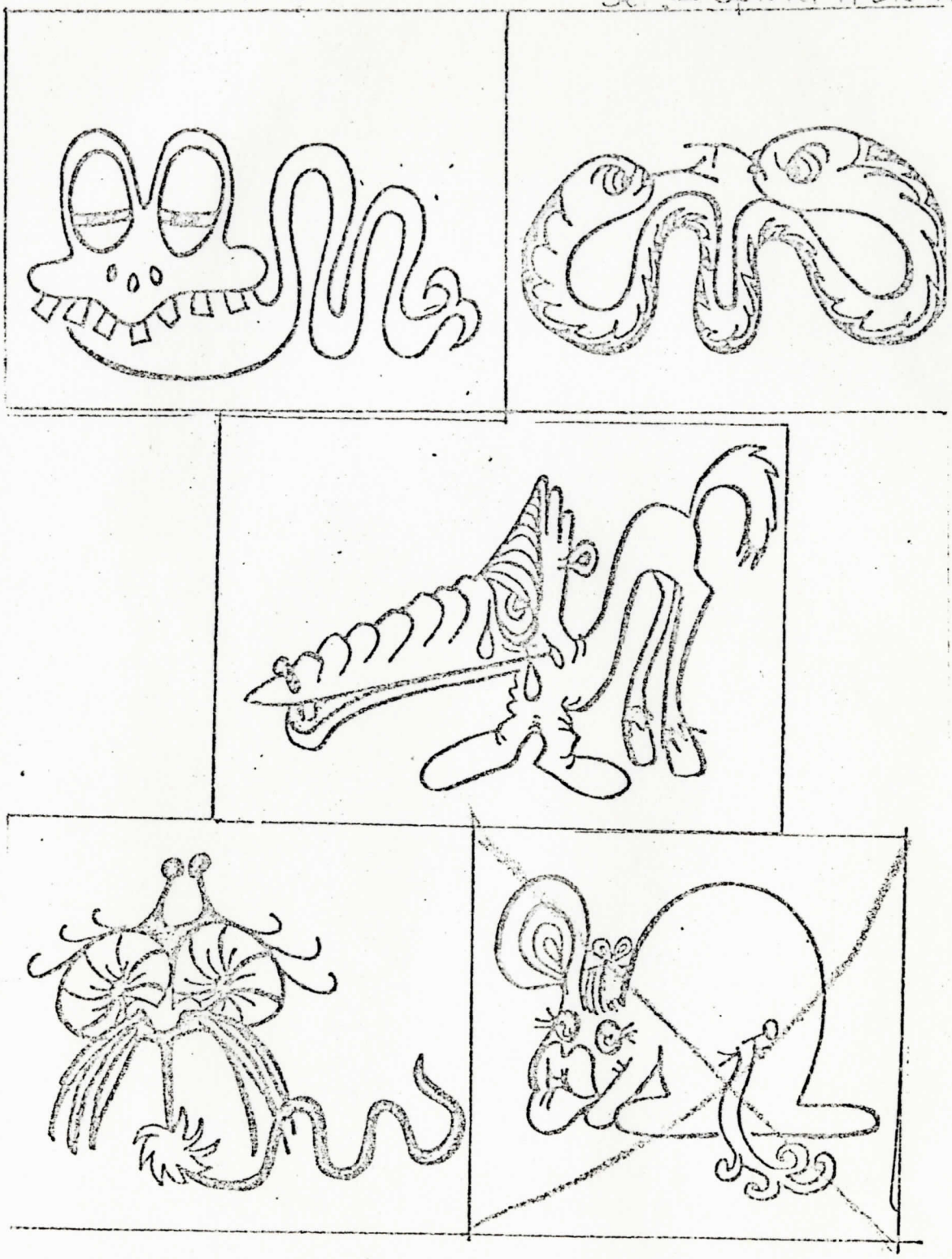




APPENDIX B



Stimulus 1 Set I Speaker A Listener C



Shelton
Speaker's Name

Paula
Listener's Name