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IMITATION OF A PEER MODEL BY SEVERELY RETARDED INSTITUTIONALIZED BOYS.
The Ohio State University, Ph.D., 1970
Psychology, general

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1971
IMITATION OF A PEER MODEL BY SEVERELY RETARDED INSTITUTIONALIZED BOYS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of the Ohio State University

By

Margaret Noell Kindberg, B.S. in Educ., M.A.

* * * * * *

The Ohio State University
1970

Approved by

[Signature]
Adviser
Psychology Department
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I am grateful to my family who have assisted me in many ways, directly and subtly, to begin and to pursue the activities that interest me.
VITA

I, Margaret Noell Kindberg, was born in Raleigh, North Carolina, June 23, 1913. I finished high school in Alexandria, Virginia in 1930 and attended George Washington University one semester. Later, I trained as a medical technologist in the Division of Laboratories and Research, New York State Department of Health, Albany, New York and worked in Albany and Corning, New York.

In May 1941 I married Edwin Allan Kindberg. We had three children: Eric, Ann, and Jon.

I resumed college at Toledo University on a part time basis in 1950, then transferred to Ohio State University when we moved to Worthington in 1955. I received a B.S. in Education in 1957 and an M.A. in 1960 from Ohio State University. From June 1960 to January 1966 I worked part time as a research assistant and as a teaching assistant at Ohio State University. From January 1966 to the present I have worked at Columbus State Institute, Columbus, Ohio.
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INTRODUCTION

It is the purpose of this study to investigate the social influence of a peer model on the imitative behavior of severely retarded boys. Such a study, hopefully, will contribute some insight into early social learning experiences of normal children.

Most young children are able social learners. By the age of two years many children demonstrate instances of social skill. Much of their social skill reflects imitation of their parents. Under favorable circumstances children's imitative activities are appropriately cued, reinforced, and integrated into increasingly more effective social behavior. Theories and reliable reports of children's early social behavior are available, but experimental studies are relatively few. Experimental research with young normal children is frequently neither convenient nor acceptable to parents. In contrast, experimental studies with institutionalized severely retarded subjects are encouraged as the retardates profit directly from the stimulation provided by research participation. In addition to partially compensating for the scarcity of available "naive" subjects, the institution provides a favorable experimental setting because of the relative uniformity of the prevailing social circumstances.

Severely retarded children between the ages of 6 and 12 years test in the mental age range of 18 to 45 months. However, the
imitative activities of severely retarded children are noticeably less frequent, less diverse, less facilitative, and less socially oriented than the imitative activities of young normal children of comparable mental ages. The observed discrepancy of socially cued imitative behavior between young normal and severely retarded children of comparable mental age led to the formulation and testing of the following hypotheses.
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Adapted from Heber (1961)
I. EXPERIMENTAL DESIGN

Subjects

Nineteen severely\(^1\) mentally retarded institutionalized boys; CA ranged from 7-7 to 13-0 at the beginning of the study. The boys lived in two different buildings about 1000 feet apart. The subjects living in one building were designated Group 1; the subjects living in the other building were designated Group 2.

Models and recordings

Two models were used, 1) the Experimenter, with whom the subjects were trained to criterion, and 2) the peer model, a moderately\(^1\) mentally retarded institutionalized boy.

Video-tape recordings were made of each subject’s imitative performances with the peer model and with pictures of the peer model. Four sets of video-tape recordings were made and rated for each subject.

Design

Each subject was trained to imitate the Experimenter to criterion. Criterion was specified as 5 consecutive performances in which more than 90 percent of the 40 gestures and block manipulations presented by the Experimenter as model were appropriately imitated by each subject. After reaching criterion with the Experimenter as

\(^1\) See Table 1.
model, each subject demonstrated his ability to imitate the peer model's performance of 40 gestures and block manipulations. The time and circumstances that were prevailing when each recording was made were: 1st recording—the peer model instructed each subject to "Do this" for 40 gestures and block manipulations. Verbal communication was limited to the peer model saying the subject's name, "Do this," and "Good."

2nd recording—made twelve weeks after the 1st recording, without practice, in circumstances similar to those in the 1st recording; the 16 subjects were the boys who had demonstrated some appropriate imitative responses when cued by the peer model on the 1st recording.

3rd and 4th recordings—twenty-eight weeks after the 1st recording, 25 pictures of the peer model were presented to each of the 16 subjects by the Experimenter. The pictures were presented in two forms:

1) Kodachrome slides projected on a screen to near life-size, and
2) Kodacolor prints, 3½ x 4½ inches. Upon presentation of each picture in each form, slide and print, the subject was told by the Experimenter to "Do like Chipper." Video-tape recordings were made of each subject viewing and responding, or failing to respond, imitatively to the pictures of the peer model's gestures and manipulations. Recording 3 demonstrated the subjects' responses to the slides projected to near life-size; Recording 4...
demonstrated the subjects' responses to the same pictures presented as prints. The slides and prints were balanced in their presentation to the subjects of each group. Recordings of each subject's responses to both forms of the same pictures were made on the same day.

The major experimental variable to be measured was the effects of social interaction between the peer model and Group 1 subjects, in contrast to Group 2 subjects who did not have the opportunities for social interaction with the peer model. Group 1 boys were with the peer model for a controlled number of rewarding, social activities between the 1st and 2nd recordings and had no contact with the peer model after the 2nd recordings. Group 2 subjects had no contact with the peer model except when the 1st and 2nd recordings were being made.

Each subject was rated for imitating appropriately on cues provided by the peer model, and by the two forms of the pictures of the peer model depicting gestures and block manipulations similar to those he had used in person. Ratings were made by three psychology graduate students using a 5-point scale. A score of 5 represented more than 80 percent imitative responses to the cues; a score of 1 represented 20 percent or less imitative responses, and intermediate points were proportional.
II. HYPOTHESES

H-1. Severely retarded institutionalized boys, trained to imitate the Experimenter on cue, will not demonstrate transfer of imitative responses to similar cues provided by a peer model.

H-2. Group 1 and Group 2 boys who demonstrate transfer of imitative responses to cues provided by the peer model, will not differ significantly in the ratings of their imitative responses.

H-3. Twelve weeks after demonstrating transfer to a peer model, Group 1 boys will not differ significantly from Group 2 boys in ratings of their imitative responses cued by the peer model.

H-4. Twelve weeks after demonstrating transfer to a peer model, Group 1 and Group 2 subjects will not differ significantly in ratings of their imitative responses cued by the peer model initially.

H-5. Twenty-eight weeks after demonstrating transfer to a peer model Group 1 boys will not differ from Group 2 boys in ratings of imitative responses to cues provided by pictures of the peer model.

H-6. Both Group 1 and Group 2 boys will not differ in ratings of imitative responses to pictures of the peer model when compared to responses cued by the peer model in person.

H-7. Both Group 1 and Group 2 boys will not differ in ratings of imitative responses to pictures of the peer model presented as 1) slides projected to near life-size, and as 2) prints.
H-8. Results of the Merrill-Palmer Scale of Mental Tests and the Vineland Social Maturity Scale will not differ significantly when administered, 1) before imitative training begins, and 2) three months after completion of imitative training.
III. BACKGROUND

Imitative behavior is the focus of the present study and research. English (1958) defined imitation as "Action that copies the action of another more or less, with or without intent to copy." The actions in imitative behavior more generally involve the proprioceptor, visual, and auditory senses. The integration of data from these sense receptors permits the reenactment of similar behavior by the organism. Overt actions and discernible sounds are the evidence for recognizable imitation (Piaget, 1962). Over time, memories, imagery or image representation, semantic representation and labelling, and other associative cues can aid and frequently are incorporated in production of recognizable features of imitative behavior.

Imitative behavior has been reported to occur in children ten to twenty days after birth (Church, 1961), evidenced by the protrusion of the tongue on cue from an attending adult's behavior. Increased babbling was elicited from three month old infants by imitating their babbling sounds repetitively (Rheingold, Gewirtz, & Ross, 1959). Carroll (1964) noted that children babble when two to three months of age; deaf infants also babble at that age. Hearing infants' babbling was reported to increase with adult responses of babbling as reinforcement. Before a child is one year old, the elaboration of imitative sounds usually emerges as the "first word," often greeted with enthusiastic acclaim by the mother when unrecognizable to others.
Several investigators (Gesell, 1928; Bayley, 1937; Cattell, 1960) described a year old child as typically saying two or three words. Children are reported to display overt imitative motor behavior before one year of age (Darwin, 1951; Piaget, 1967). Spontaneous movements involving the hands are among the first to be imitatively approximated. Examples are waving "bye-bye" and clapping "pat-a-cake," occurring typically before the child is forty weeks of age (Gesell, 1940). First, a few observable motions are frequently engaged in repeatedly; then the child's repertoire of imitative motor responses rapidly enlarges if responsive socializing agents are present. Most mothers, fathers, grandparents, and other family members sufficiently fulfill the socializing roles during the child's early life to influence sex-role identification and other social functioning through selective, repetitive reinforcements (Sears, 1957 & 1965; Aronfreed, 1968). By the end of the second year most children demonstrate a basic repertoire of sensory-motor functions which includes the imitative activities necessary for higher level performance (Piaget, 1967). These imitative behaviors can be readily recognized, and many can be cued by either actions or words. The development of overt motor imitation parallels the imitation of sounds and the emergence of speech for most children (Piaget, 1967; Gesell, 1940; Cattell, 1960).
When imitative behavior is first evidenced, the actions that are observed by the child occur close in time to the child's imitative responses. By the end of the second year imitative behaviors may occur hours or days after the initiating actions occur. When a delay of time occurs, the imitative responses are cued by an associated, similar, or reobserved object, activity, person, or other stimuli. The concept of imagery is used to explain the ability to match or approximate actions over a period of time. Imagery may be defined as visual representation of past experiences or visual representation based on memory. The concept of imagery appears to be necessary to explain imitation (Piaget, 1952). Imagery evolves from perceptions. Infant studies of perception, e.g., pattern preferences, effects of drugs, concomitant autonomic functioning, etc., are reported by several investigators (Fantz, 1962; Stechler, 1964; Kagan and Lewis, 1965). The manner in which imagery develops may be in the first phases of being understood. The dominance of visual sense data over proprioceptor and auditory data, reported in several perceptual studies (Rock, 1966), would tend to support that perception is a major mode of mediation of responses.

Imitative behavior is evidenced at different ages in many settings. Aside from the pleasure of miming or mocking to entertain, there are many instances of imitative behavior that can be described. The integrated visual-motor process of imitation is
evidenced when there is imitative accommodation to new patterns of observed behavior, demonstrated in many social situations. Examples are an adolescent in a new peer group and an adult traveler, who observe and adopt subtle variations of behavior in accord with the behavior observed in new circumstances. The imitative variations of behavior are rewarded by being socially accepted and, also, by allowing the performer to feel less conspicuous. The newly adopted behaviors may be repeated in other circumstances that appear appropriate (generalized), if sufficiently rewarding and satisfying. Less readily noted but more commonly present are the everyday experiences of accommodating our behavior in accord with settings, roles, moods, and response tendencies that occur from moment to moment in social situations. The degree of imitation often is carefully controlled to exhibit a socially acceptable extent of imitation and, simultaneously, to prevent the more exact replication of behavior associated with mockery. To relieve the tension of that sort of controlled behavior, after the social encounter more precise or exaggerated imitation is frequently displayed, or rehearsed without overt expression. The overt imitation appears to dissipate the tension of those incidents more effectively.

The imagery of form and movement integrates the visual, auditory, and proprioceptor sense data to evoke successive motor responses that match or approximate selected observed actions.
Associations within the individual and associations between and among the individual and external agents and objects, appear to be observed and recalled through imagery and other cueing mechanisms, e.g., odors, temperatures, sounds, words, etc. Mediation of those cues increases the range and the complexity of the responses. Their seriation in syntactic and logical sequences becomes a thought. This remarkable process is best exemplified by the development of language (Staats, 1968), which begins with the imitation of sounds and can culminate in the expression of the most complex and abstract concepts of which mankind is capable, still utilizing the same sounds available in childhood.

For this research the study of imitative behavior will be limited to observable motor responses cued by the overt motor activity of a model, or by pictures of a model, depicting gestures and block manipulations. The lapse of time between the subject focusing on the model or on a picture of the model and the imitative response of the subject, will be within a period of a few seconds. These limitations are similar to the circumstances that would prevail in early imitative experiences.

A mentally retarded population is appropriate for investigation of imitative behavior (Berlyne, 1967), particularly with the above limitations. The restricted development and variable rates of development of retarded individuals are representative of some
early periods of development among normal subjects. There are wide variations in the levels of performance displayed among retardates with similar diagnoses, disabilities, and histories. And many different diagnoses with varied syndromes are evidenced in a retarded population (Robinson & Robinson, 1965). However, retarded persons of almost any chronological age demonstrate less varied imitative behavior when compared to average persons of similar mental ages (Bijou, 1966; Baer, 1968). The relatively limited number of behaviors the severely retarded individuals evidence, are often performed repetitively, and not cued appropriately or facilitatively to environmental stimuli. More frequently their imitative activities appear to occur randomly or to be associated with a limited number of cues. The perseveration and echolalia often demonstrated by the severely retarded, are not adaptive behaviors as they are not used in a socially responsive and communicative manner. Young normal children frequently repeat behaviors, but their repetition has practice value or is exploratory and varied or combined to gain effects and experience. Typically the severely retarded have little or no speech, and their visual-motor behavior is noticeably restricted in overt imitative social behaviors. Among the mentally retarded, the rate and complexity of development of the integrated visual-motor
processes are slower, less extensive, and more irregular.

The symptoms of mental retardation are sometimes directly evident. The reflexive behaviors of the newborn infant may be noted to vary from those of the typical newborn and lead to classification of mental retardation. The reflexive patterns are considered to be indicative of neural functioning (Arieti, 1967). Physiological, organic functioning and coordinated, integrated development usually proceed when neural functioning is within normal limits. Defects in reflexive patterns can be predictive of other misfunctioning.

In public institutions retarded individuals who function at the lowest levels of development, as may be seen in Figure 3, are present in the largest numbers. Among the least developed individuals (the severely-profoundly retarded), most are able to eat, i.e., pick up food, place it in the mouth, chew, and swallow; many can walk. Additional behaviors are variable and often unreliable in relation to regularly occurring cues. Many of these severely-profoundly retarded do not perform the limited number of motor activities of which they are capable (Bensberg, 1965). Many do not imitate, i.e., pattern the physical actions they can do on cue from similar actions of someone else. The lack of or limited use of imitative visual-motor activities is partially compensated by having some necessary, reoccurring activities associated via conditioning processes. The
routine living activities are recurrently and sequentially patterned by the attendants into habit patterns. In a different setting with different people, the conditioned habit patterns probably would not be evidenced. Some of these children\(^1\) make sounds or say a few words; but for most of them, speech is meaningless. Voice quality, e.g., loudness, may elicit associated behaviors such as passive withdrawal or excitation or increased aggression regardless of the situation. Quickly executed gestures or movements have been observed to elicit associated responses of withdrawal and cowering.

The children who can see, and also some with impaired vision, can learn either to use visual-motor imitation or to use it more effectively and more frequently. Attempting to train children to imitate by exaggerated gestural display is occasionally successfully accomplished; but the behavior is not reliably repeated on cue unless reinforced. Training children to imitate through the use of conditioning procedures would be more effective, requiring less time and trials, and achieving greater specificity and precision of performance. In addition to training children to imitate, there is the problem of maintaining the training through intermittent reinforcement from socializing agents. Many conditioning programs with

\(^1\) In some instances children is a euphemistic term; severely-profoundly retarded individuals may be in their teens or older but their behavior and required care are more characteristic of young children.
severely retarded children have been successful in the laboratory setting but were extinguished on the regular living units through lack of intermittent reinforcement. In the crowded conditions generally prevailing in public institutions, with few attendants available, the residents may inadvertently be reinforced for undesirable behavior by the attention they receive because of the necessity to protect them and other residents. Reinforcement for acceptable behaviors should not be solely dependent on attendants. The number of attendants is too small to fulfill the needs, and personnel turnover is too great for extensive positive influence to be established.

Imitative behavior explored from a developmental view-point and within a developmental context can also provide data and possibly insights useful in areas other than mental retardation. Some disadvantaged children appear to suffer from atypical, interpersonal, socializing influences which are more difficult to study in non-institutionalized settings, even when parents are cooperative. As knowledge of perceptual processing expands from the newborn's attending to stimuli through the development of successive discriminatory responses including imitative responses, much can be contributed by research with retardates that can be helpful both to retarded and to normal children.
IV. REVIEW OF THE LITERATURE

Theory

Developmental theories encompass varying extents and aspects of behavioral activities and relationships. Several theories will be briefly reviewed for concepts and implications relating to imitative behavior.

Imitative behaviors are included in the developmental theory of Freud (1949). The concept of imitation is not elaborated directly, but it is used in his descriptions and in some of his theoretical constructs. Play, ego-ideal, identification, fixation, super-ego, etc., include imitative activities. Imitation of behaviors under relatively specifically cued circumstances is represented in certain aspects of each of these concepts. If the concepts are stated in operational terms and considered to be extended across time, they include multiple, related, and often integrated or mediated, imitative events. More recently, Eriksen (1959 & 1963) and Bronfenbrenner (1960) have elaborated Freud's theoretical concepts to include roles and imitation.

Gesell (1928, 1940, & 1947) emphasized maturational processes in his study and description of developmental change occurring in children. Both in his descriptions and in his Developmental Schedule a number of activities are described as imitative. Until the age of three, items representing relatively discrete sorts of imitative activities are included in his Developmental Schedule. At later ages:
Gesell described imitative activities in social terms that are more general, but can be construed to incorporate imitative behaviors.

Theories that emphasize perception such as the Gestalt and the Phenomenological theories (Köhler, 1930; Werner, 1957), Hebb's (1949) patterned and sequencing of perceptions, Bruner's (1964 & 1966) iconic process, Cattell's (1946) fluid (vs. crystallized), cross-cultural process, and others deal with the concept of imitation to varying extent. Redundant associations and imagery are precursors, assumptions, and/or detailed aspects of these theories (Walters & Parke, 1965). Tolman's (1932), and Lewin's (1936) goal, motivational, and expectancy theories also tend to imply imitation of behaviors. Visualization of a goal plus intermediate steps to the goal can be like successive patterns of behavior to be emulated.

Many social theories incorporate imitative concepts in the forms of self-concept, expectancies, group identification, etc. Sullivan (1953) described "personifications" and explored the imagery conjured by the aroused emotions labelled "good" or "bad" by his patients. Sears (1951, 1957 & 1965) used the concept of imitation in developmental and identificatory processes he described. The sociological and the anthropological concepts of roles, mores, and impact of social change include many aspects of imitative behaviors, their transmission and generalization within and among cultures. The patterns of child rearing, family life, religions,
rituals, institutions, manners, morals, etc., achieve their highly sanctioned status and stability through reinforced patterns of imitative behaviors. Conservatism and conformity are probably the most abstract expressions used that describe imitation.

Piaget (1952, 1962 & 1967) gives the concept of imitation an important place in his theory of cognitive development. Imitation occurs near the end of the sensory-motor stage, preliminary and apparently prerequisite to the intuitive, preoperational phase. The child receives stimulation through visual, auditory, and proprioceptor senses that are increasingly organized, and responded to in more systematic ways. However, the child's responses display many inconsistencies and variations when compared to adult organization of responses to the same or similar sensory data. The elaboration of the child's responses as he develops has been studied extensively by Piaget and has revealed sequential modes of responding.

During the first two years of life, the child experiences the beginning of the coordinated and integrated functioning of sensory-motor patterns that relate him to his environment. These patterns of responses are basic and preliminary to more complex modes of responding. Within the patterns of responses that the child learns during the first two years are the imitative behaviors. According to Piaget imitative behavior and associated imagery are necessary for further cognitive development. The infant's perceptions of environmental
features initiate imitative responses; imagery emerges as a function of integration of perceptions and aids imitative responding. Piaget does not stress or elaborate the variabilities of environmental stimulation and reinforcement. His focus is on the child's developing potentialities.

Piaget describes visual images or imagery as an internalized form of imitation. The objects, actions, and persons perceived are elements of imagery basic for further cognitive processing. The first evidence for imagery is the delayed imitation the child demonstrates; an example cited by Piaget is that of a child pretending to sleep. Piaget described this example as an instance of "deferred imagery." The term, "internalized imagery," is defined as the visualization of personal symbols; an example cited is the inferred visual representation of the lay-out or plan of a house that guides a child going to his room and returning by a different route (1962). Imagery seems relatively stabilized and capable of being evoked under appropriate circumstances; and also subject to change and increasing differentiation.

The S-R conditioning theory has been used to express some aspects of a number of the preceding theories. Miller and Dollard (1941) used the S-R model to explain imitation in terms of the chaining of matching responses. Mowrer (1950 & 1960) further explored the theoretical basis of imitation using the S-R model and
elaborated the theory to a 2-factor theory of imitation. In addition to the chaining of matching responses Mowrer's 2-factor theory included self-reinforcing responses, e.g., self-administered praise or admonitions. Bandura (1958 through 1969) has published many studies concerned with imitation. Bandura's research and discussion of imitation appears to indicate that the pervasive influence of socially cued behaviors is evident and, possibly, largely explanatory of many relatively complex behaviors, e.g., the identification process. The relatively limited theoretical speculation expressed by Bandura (1962, 1965 & 1969) appears to favor a conditioning-contiguity theory of the imitative process. Bandura (1965) stated, "...modeling procedures are most efficacious in transmitting new response patterns, whereas operant conditioning methods as applied to human behavior are typically concerned with the management and control of previously learned responses." (p. 319)

The S-R conditioning theory to describe imitative behavior is particularly pertinent to this study for several reasons: 1) the method used to train the subjects and the peer model was a conditioning method, 2) the detailed description of S-R theory is not overlapping with any other theory described, and 3) the S-R method is useful for application as well as explanation. Furthermore, it can be applied to any population at any age, and varying degrees of probable success can be predicted.
The theory may be described as follows: Random and reflexive behaviors occur with establishment of associations depending on rewards, both positive and negative. The unrewarded activities tend to occur less often and are more frequently replaced by the activities that are positively rewarded. The associations are sometime generalized to other stimuli which contain some elements of earlier stimuli. Responses by the child are selectively and somewhat consistently reinforced which induces discrimination among different stimuli. Circularly, the increased ability to associate different responses to different stimuli often produces increasing rewards and expands the range of learned associations. The pleasurable sensations of the rewarded behavior may persist after the reinforcement, and the behavior is repeated, and again may be reinforced. Anticipations probably are established concomitantly with repeated responses and reinforcements. The associations of cues in advance of an event becomes part of the discriminated, differentially rewarded course of events. Further generalization and discriminatory reinforcements with multiple associations rapidly become patterned into integrated behaviors. The activities that are recognizably patterned, observed, and repeated by the child are labelled imitation.

Theoretical speculation and explanation of imitation have been advanced by numerous investigators using the conditioning S-R model alone or with mediated variations or additional constructs (Miller &
Research studies with young and preadolescent subjects are described which include overt motor imitation as a variable. A few studies with older subjects are included to provide additional data along dimensions similar to those in studies with younger children or which appear to illustrate other developmental aspects relevant to this study. Several studies of animal imitation are included. The few reported studies of overt imitation using retarded subjects are reviewed. In addition several studies with retarded subjects are described that appear to include some elements similar to those in the present study. The research studies reported are not exhaustive within the above stated limits, but a large proportion of them are briefly reviewed.

Wilson (1958) reported a study with 14 boys and 12 girls, CA 43 to 58 months, evenly distributed in two groups. The subjects were trained for a task using 1) imitation, and 2) incidental cues (trial and error). Wilson concluded that imitation appeared to be more efficient than trial and error. Bandura and Huston (1961) varied experimental conditions with 24 boys and 24 girls, CA 45 to 61 months, paired re sex and dependency. Nurturant and non-nurturant models were used. The results were 1) children imitated both models, 2) social rewards (nurturance) facilitated imitation; aggressive imitation was facilitated in all conditions, 3) subjects
with nurturant model had significantly more pre-decision conflict on discrimination tasks. Bandura, Ross, and Ross (1961) in a study with 36 boys and 36 girls, CA 37 to 69 months, evenly divided into 8 experimental groups plus a control group, reported imitation of physical and of verbal aggression, and non-aggressive verbal behaviors with models of the same and opposite sex. A highly significant difference was found between the non-aggressive and control groups and the aggressive groups for both physical and verbal imitation. Bandura, Ross and Ross (1963-a) compared aggressive imitative responses with the same and opposite sex models to differently presented stimuli: 1) real-like, 2) filmed, and 3) cartoon filmed aggressive display. Forty-eight boys and 48 girls, CA 35 to 69 months, experienced the three conditions with no significant differences among the groups' responses, but the control group displayed significantly less aggressive behavior than the experimental groups. Boys showed significantly more aggression, and all subjects exposed to the male model displayed more aggression. Another study (Bandura, Ross and Ross, 1963-b) with 36 boys and 36 girls, CA 33 to 64 months, demonstrated that the model who possessed rewarding power was imitated more than the competitor for the rewards. "Moreover, power inversions on the part of the male and female models produced cross sexed imitation particularly in girls." Bandura, Ross and Ross (1963-c) studied nursery school subjects, 40 boys and 40
girls with experimental conditions 1) aggressive model rewarded, 2) aggressive model punished, 3) an expressive model showing no aggression, and 4) no model. Group 1 subjects showed more imitative behavior. Bandura (1965) reported 33 boys and 33 girls, CA 42 to 71 months, observed films in which models, two male and one female, were 1) rewarded, 2) punished, and 3) hand no consequences for aggressive behaviors. The subjects imitated the models who were rewarded, or had no consequences. Then the Experimenter offered rewards to all subjects to reproduce the aggressive behaviors observed. There was equal imitative learning evidenced among groups.

McDavid (1959) in a study with 32 children, CA 45 to 67 months, demonstrated that older females and younger males exhibited more imitative behavior. In another study (McDavid, 1964) 18 boys and 14 girls, CA 48 to 62 months, imitated a model of the same sex as the subject with 4 contingencies of reward: 1) high, 2) better than chance, 3) random, and 4) no reward. Evidence indicated that, "imitation follows 'success'." Also, imitation appeared to be based on model associations, not on relevant cues.

Rosenblith (1959) reported a study with kindergarten subjects, 60 boys and 60 girls, for four variables: effects of adult presence, withdrawal of adult attention, sex of adult, and sex of child. The results demonstrated learning by imitation improved 1) in the presence of a model, 2) with male leaders, 3) among boys, and that 4) boys
with male leaders were most affected by withdrawal. In another study with 80 kindergarten subjects Rosenblith (1961) explored the variable of attentiveness, sex of model, and imitation on tasks and matching of colors. The results indicated that boys imitated more generally, and girls matched colors more. The design was an attempt to test Miller and Dollard's theory of matched dependent contrasted with independent imitation. An increasingly difficult series of Porteus Mazes were the dependent tasks that also served as measures of ability; color choices were assumed to be an independent variable and consisted of selecting the same color pencils the model used. Less capable girls and more capable boys matched colors more often. The more capable boys who experienced leader withdrawal, had higher scores throughout. The less capable boys did not differ in pre- and post-experimental performances on the Porteus Mazes. Boys imitated the same sex leaders more than girls. Girls imitated leaders of either sex who provided more attentiveness.

Baer and Sherman (1964) used a puppet as model and social reinforcer to establish three behaviors in 7 of 11 "young" subjects. An additional behavior demonstrated by the puppet but never reinforced, was imitated by the children. After establishment of the imitative behaviors, two of the children were treated to extinction, i.e., other behaviors were socially reinforced; and two children experienced "time-out", i.e., none of the previously
reinforced experimental behaviors were exhibited by the puppet. When the original conditions were reinstated, i.e., the 3 behaviors were again socially reinforced, there was an increased rate of imitative responses including the behavior never reinforced.

May (1966) reported a study of 144 children with equal numbers of boys and girls in age groups approximating 3, 5, and 7 years, with male and female adult models. The variables studied were relevant (observing model being reinforced) and irrelevant (observing model who does not get reinforced); same and opposite sex models; reinforcements were 100 & 50 percent. Irrelevant imitation was a function of age; relevant imitation was evident on the first trial across age groups, but on succeeding trials was less consistent. Relevant and irrelevant imitation were not correlated for either acquisition or extinction trials. Irrelevant imitation was stable over extinction trials; relevant was not. Relevant and irrelevant imitation were differently affected by rates of reinforcement. There was no significant difference between male and female performance of relevant reinforced imitation. The male model elicited more imitation during extinction but not in acquisition. The same sex model elicited more irrelevant imitation than the opposite sex model.

Kaplan (1968) studied gestural representation of implement usage. Subjects were 72 boys in 3 groups with CA's approximating
30

4, 8, and 12 years. The implements were described as 8 personal and 8 extrapersonal, and half of each group of implements was considered familiar and half unfamiliar to the subjects. The 8 personal implements were gesturally utilized by each subject in three ways: with himself, with another person present, and with another person absent. The 8 extrapersonal implements were gesturally utilized relative to a present concrete object and to an absent object. With increasing age gestural representation reflected increasing degrees of differentiation of components of symbolized situations and with greater frequency. The order of the modes of representation was 1) pointing, 2) direct manipulation, 3) body-part as object, 4) holding, plus body-part manipulation, and 5) holding, hand posturing, plus articulation. Absence of objects induced increased differentiating responses. With vicarious experiences, there was an increase of gestural representation with more articulation.

Andrews (1966) studied peer imitation of 64 three and four year old children matched for age and sex under three different conditions of task familiarity: 1) the subject and peer model had no previous experience, 2) the subject and peer model had previous experience, and 3) the subject had no experience, but the peer model was experienced with the tasks. The three conditions affected the amount of imitation. Significantly more imitation occurred with Condition 3. Condition 1 was least effective but did not differ
significantly from Condition 2. The results implied that, "task familiarity appears to override differences previously attributed to sex and age factors."

Hartup and Coates (1967) used a peer model with 56 nursery school children. The children were selected and grouped as to whether they were frequently reinforced or infrequently reinforced by their peers in the school setting. Half the children of each group were exposed to a peer model who rewarded them; the other children had similar experiences without reward by the peer model. The subjects frequently reinforced by their peers, imitated the rewarding model more than the non-rewarding model. The subjects infrequently reinforced by their peers, imitated the non-rewarding model significantly more than the rewarding model.

Bandura and Kupers (1964) compared adult and peer models for self-reinforcement using 80 boys and 80 girls, CA 7 to 9 years, in 16 experimental groups plus a control group. The peer models were not previously acquainted with the subjects. The variables studied were high and low criteria of reward, male and female adult model, male and female peer model, and sex of subjects. In this study adults were more effective models than peers, and the children closely matched the models' modes of rewarding.

Patterson and Anderson (1964) studied the social influence of peers using 33 boys and 32 girls, CA 7 to 10 years, in the 2nd and
3rd and 4th grades. Peer models used social reinforcement to effect significant changes in preference for simple motor activities. Older children showed more marked changes in preference than younger subjects. Both boys and girls in 2nd and 3rd grades showed more marked changes in behavior when reinforced by friends than by non-preferred peers. There was significant correlation for boys between amount of preference change in the experimental situation and teachers' ratings of traits reported by other investigators as most valued by the peer group. Clark (1965) reported a study with 18 boys, CA 9 to 11 years, for acquisition and extinction of peer imitation. The response consequences to the peer model were varied. Reinforcement of the peer model yielded a significant increase in imitation. With a non-reinforced peer model there was a tendency to counter-imitate.

Stein and Wright (1964) studied 120 preschool children under three conditions: 1) nurturance, 2) nurturance followed by withdrawal, and 3) isolation. Imitative responses increased when subjects responded to conditions 2 and 3 with increased dependence; and when subjects responded to 1 with reduced dependence. The authors' interpretation of the results was that imitation may reduce dependency anxiety aroused by withdrawal or isolation, and that the emotionally neutral activity of imitation follows satisfaction gained through nurturance. Madsen (1966) reported a study with
twenty matched pairs of upper middle class nursery school children. Subjects were assigned to nurturant and non-nurturant teachers for a summer session. Two graduate students who served as models for the experimental film were present in the class for a few minutes each day. At the end of the session the subjects were exposed to films depicting aggressive behavior by the familiar models and by a strange model. The aggression imitated following the subjects' viewing the film revealed that familiarity of the model and the sex of the model were more significant than the nurturance variable. More boys imitated the familiar male model. Children demonstrating aggression appeared more stable and well adjusted.

Grusec and Mischel (1966) reported a study with 28 preschool children, CA 38 to 56 months. Eight boys and 6 girls were in each of two groups with models 1) rewarding and indicating future control, and 2) non-rewarding and indicating no future control. After the models were exposed to each group, the subjects experienced neutral and aversive stimuli. The subjects with the rewarding model indicating future control, produced significantly more recall and imitation.

Ross (1963) hypothesized that children with high dependency would imitate more incidental cues, and children with low dependency would imitate more task related cues. Fifty-two subjects were grouped for high and low dependency, 13 boys and 13 girls in each
group. The teacher taught a skill, then the child taught the skill. The results indicated support of the hypotheses, except that the low dependency girls did not perform the more independent, task related imitations much differently than the high dependency children.

Epstein (1968) studied the effects of social isolation on imitation. Forty subjects were selected from among 60 3rd and 4th grade girls who expressed the highest and lowest need for social acceptance. Festinger's cognitive-dissonance theory was supported. "Subsequent to a period of social isolation commitment to further isolation reduces a child's motivation for social reinforcement" (imitation). Walters, Marshall and Shooter (1960) reported a study, "Anxiety, isolation, and susceptibility to social influence" using thirty-six 11th and 12th grade boys. Depending on self-report of high and low anxiety, the subjects were placed in four groups: 1) isolated-anxious, 2) isolated, non-anxious, 3) non-isolated, anxious, and 4) non-isolated, non-anxious. Pre- and post-experimental tests were given and suggestions (the experimental variable) were given with the post-test. The results indicated that anxiety, not isolation, produced susceptibility to social influence. In the discussion, an earlier unpublished study was described, with younger children, in which isolation produced anxiety and confounded the results of the study.

Dubanoski (1967) reported a study with 1st and 2nd grade boys
for appropriateness of behavior and response consequences to the model. Films depicting masculine, feminine, and neutral modes of grooming were presented under conditions of 1) rewards, 2) punishment, and 3) no consequences. The observed imitative behaviors were classified as imitative, partially imitative, non-imitative, and no behavior evidenced. The results indicated that reward and no consequences are similar and facilitative of imitation; punishment inhibited imitation. Masculine grooming was imitated most and feminine least. With corrections for no model condition, neutral was first, masculine second. Reward did not facilitate feminine type imitation. Barnwell (1966) reported a study in which symbolic and peer models and rewards were varied. Subjects were three hundred and fifty-three 1st and 3rd grade children. Symbolic models varied from 1 to 5 across groups of children; symbolic models expressed preferences on two tasks and subjects made choices on the same two tasks. Children were exposed to a peer model, and the model was reinforced with 1) a novel reward or 2) a well-known pop drink. There were two controls groups, one observed a non-reinforced model and the other observed no model. The results demonstrated that more novel choices were made with a model than without a model; 1st grade children imitated the adult symbolic models more, and 3rd grade children imitated the peer model more.

Bandura and Mischel (1965) studied 60 boys and 60 girls from
the 4th and 5th grades grouped for their marked preference for 1) immediate reward or 2) delayed reward. Three experimental groups were exposed to a live model, a symbolic model, and no model for comparison of influence contrary to preference. Live and symbolic models both influenced subjects to exhibit counter patterns of delay or immediate reward, when measured immediately after the experiment and one month later. High delay children with symbolic models were less stable over time.

Bandura and Whalen (1966) studied 80 boys and 80 girls, CA 8 to 11 years. Male and female models of inferior, equal, and superior competence, and no model were used under conditions of success and failure for each. Results indicated superior attainments outweighed reinforcement history, i.e., high rate of reward after high scores prevailed regardless of previous success or failure. Hicks (1968) studied the effects of co-observers' sanction and adult presence on imitative aggression using 42 boys and 42 girls with a mean age of 7 years. Results indicated that expectancies for various consequences appeared to determine amount of imitation. O'Connell (1965) studied competitive and cooperative set with 20 male and 20 female college students in pairs for 120 trials each pair with 80 and 20 percent reinforcement schedules. The cooperative pairs evidenced significantly more imitation; also, the level of reinforcements and insight significantly affected imitation.
Hill and Liebert (1968) reported a study using different numbers of models under consistent and inconsistent conditions with 21 boys and 21 girls, CA 9 to 10 years. There were six experimental groups plus one control group. The results were diagrammed as follows:

Least influential—MODELS USED—Most influential

inconsistent 3 2 1 0 2 3 consistent

Liebert and Allen (1969) investigated the effects of a model's prior experience on children's imitation while playing a game. Subjects were thirty-two 8th and 9th grade boys. Only the preferences of experienced models were imitated beyond chance, and the amount of imitation tended to increase as the models' experience increased. Resnick (1967) reported a study with college undergraduates in which acquisition of imitation was high relative to model competence and high levels of reinforcement. Across trials, the effects of model competence were constant; the effects of reinforcement increased imitation.

A few studies which have verbal variables are being included because overt behavioral variables were also part of the studies. Corsini (1969) measured the retention of nonverbal cues of 52 children, CA 58 to 73 months, in four groups, using the same instructions and objects in all conditions. The mean scores were Verbal only, 7.6; Verbal-visual, 10.7; Verbal-visual-pointing, 15.3;
and Verbal-visual-pointing with movements, 15.5. Bandura, Grusec and Menlove (1966) varied incentives for observational learning with 36 boys and 36 girls, CA 6 to 8 years. Three conditions were used, 1) verbalizing with the model, 2) performing competing responses (counting), and 3) attending only. The stimuli were a man model, a film, and universal actions. The incentive conditions were not significant. Verbalization was significantly higher than attending; and attending was significantly higher than the interfering, competing condition.

Ofstad (1968) studied both overt imitation and verbal imitation using high and low criteria of self reward. Forty-eight boys and girls in three groups, two experimental and a control, played a bowling game with two adult models. Compared with the controls, there was significant imitation of same-sex models for both conditions of self-reinforcement. Verbal imitation was less marked but in a similar direction. Osser, Wang and Zaid (1969) compared two groups, 16 LC Negro and 16 MC white subjects, CA 55 to 63 months. Comparisons were made between imitating and expressing understanding through selection of appropriate pictures. The white MC children did not differ significantly between the two modes; the Negro LC children demonstrated significantly more successful imitative responses than successful discriminations among pictures. DeRath (1964) reported 60 nursery school boys in
three groups, 1) observed a five minute film depicting aggressive behavior, 2) observed the same film with prohibitions re aggression, and 3) did not observe the film. After the above all the boys experienced similar frustration then were observed in free doll play. Group 1 boys imitated the aggressive behavior in the film and also displayed other aggressive behaviors. Group 2 boys inhibited imitation of the filmed behavior.

Walters and Amoroso (1967) reported a study with male college students under two conditions of pictured stimuli, neutral and sexually arousing, and with arousal by noise. Eye movements were studied in relation to suggested standards of behavior. The results indicated that the imitative behavior can be elicited without rewards; and uncertainty tends to induce imitativeness. "Physiological arousal under some circumstances may facilitate imitation, but it appears to be subordinate to perceptual-cognitive factors."

Bandura, Blanchard, and Ritter (1969) reported a study with adult subjects for snake bite phobia desensitization under four conditions: 1) symbol desensitization, 2) symbolization modeling, 3) live modeling with guided participation, and 4) no treatment. Live modeling with guided participation produced the most effective and extensive results; desensitization effects extended to other anxiety situations.

Studies of discrimination performance share some mutual
elements of imitative studies. Cross and Vaughter (1966) studied 18 preschool subjects, CA 30 to 72 months, in two groups: the younger, less than 54 months and the older, more than 54 months. The performance of the younger subjects was most efficient following non-rewarded information trials. This is consistent with infrahuman studies and is labelled the Moss-Harlow effect.

A number of studies of imitation using animal subjects have been reported. A few of them will be cited. Darby and Riopelle (1959) reported an observer monkey performed 65% of 400 tasks successfully in one trial after three demonstrations by a demonstration monkey. Also, two pairs of monkeys were compared performing 500 object quality discrimination problems. The first pair to make discriminations was observed by the second pair. The demonstration pair of monkeys was correct 50% and the observer pair was correct 75% on the first trial. It was noted that observer learning was higher if the demonstration monkeys made a mistake. Harlow (1944) reported monkeys learned through observation without rewards and transferred the discriminatory learning to other situations.

Davitz and Mason (1955) reported fear reduction in fearful rats when in association with non-fearful rats; to a less extent fear was reduced in a fearful rat when in the presence of another fearful rat. Church (1957-a) trained rats to follow a leader rat.
In other situations the rats demonstrated learning of appropriate cues while following the leader rat. Church (1957-8) reported using two methods, trial and error and incidental cues, for training rats to follow. Angermeier, Schaul, and James (1959) reported that 5 "naive" rats imitated rats conditioned with shock-buzzer at the sound of the buzzer only. Stimbert, Schaeffer, and Grimsley (1966) reported rats imitating in open field with access to water contingent on following; there were four choice point alternatives.

John, Chesler, Bartlett, and Victor (1968) compared cats' performances after observational and conventional shaping procedures. Observer cats acquired an avoidance response faster and with fewer errors, and acquired an approach response with fewer errors than the conventionally trained cats. In some cases, observer cats committed one or no errors while reaching criterion. Chesler (1969) reported litter-mate kittens who observed their mothers perform, acquired and discriminated the responses sooner than kittens who observed a strange female cat's performance. Initial differences in attentiveness to demonstrator performances disappeared by the second day. Food sharing and other forms of social behavior were exhibited by both mother and stranger cats.

Two studies of imitative behavior with severely retarded children were reported. Peterson (1966) trained two 12 year old severely retarded girls to imitate him. The training required 130
trials which occurred 3 to 4 times a day when the subjects were judged to be hungry or at meal time. The tendency to imitate increased with training. After experimental extinction of both generalized and reinforced imitation, some contingent reinforcement was required to reestablish performance of all imitative responses previously displayed. Baer, Peterson, and Sherman (1967) described in detail the training of three severely-profoundly retarded children, one boy and two girls, who initially demonstrated no imitative behavior. The subjects performed 130 different behaviors on cue from the Experimenter model; some of the behaviors were never reinforced.

Four reported studies used moderately and mildly retarded subjects. Keogh and Keogh (1967) compared two groups of children, 39 retarded boys with CA 9 to 10 years and IQ's 51 to 77, and eighty-four normal, school boys with CA 6 to 9 years, on two types of imitative tasks: copying patterns by 1) drawing 4 line patterns, and 2) walking the patterns. Retarded subjects were imitatively similar to 6 year old normal boys on both tasks and significantly different from the other age groups. No differences were found between drawing and walking for normal subjects. There was a significant difference between drawing and motor performances of retarded subjects. The retarded subjects had "extreme difficulty in organizing their gross movements to represent patterns
in a larger spatial field." Kleibhan (1967) trained 48 retarded males for an occupational task using three conditions as follows: 1) expectancy—in advance stating the number of items to be finished; 2) modeling—a normal boy as model with instructions to "Do like ______."; 3) control—the usual procedure. Condition 2 was most efficient immediately and 3 and 4 weeks later. After 5 weeks, when the study was terminated, Condition 1 was beginning to excel over Condition 2. Both 1 and 2 were better than 3 throughout. O’Donnell (1967) compared 40 normal, IQ 90 to 110, and 40 retarded, IQ 50 to 75, in four experimental groups and a control group for observing response acquisition and its effects on discrimination. Instructions were specific and non-specific, and types of responses were differentiated and non-differentiated. The results indicated that intelligence varies indirectly with attention; but intelligence varies directly with attending to relevant details. Duller subjects attended the easy dimensions. Initially there was no significant difference in performance of retarded and normals on the tasks used. Only in the last half of training, normals made significantly more responses than retardates. Edmonson, Leland, and Leach (1966) compared social cue interpretation of retardates. Group 1 was trained relative social cues, Group 2 spent equal time with films, and Group 3 had no additional experiences. Group 1 learned to make social interpretations better
but their classroom behavior was not improved compared to Group 2.

Three published articles report using imitation with retarded subjects, but they are not experimental studies. Edmonson, DeJung, and Leland (1965) used imitation, role playing, gestures, etc., in a program of social perception training. Clithera (1965) reported the benefits of free drama on the interpersonal relations of five boys and five girls. Blackhurst (1966) recommended socio-drama for adolescent retardates.

More studies are reported using imitation with disturbed children than are reported with retarded subjects. Only two will be cited. Marshak (1967) studied imitation and participation of parents with 4 normal, 1 retarded, and 3 disturbed boys, 3 to 4 years of age, white, middle class. Each subject was observed in interaction with the parents. Normal children demonstrated greater facility for spontaneous and non-required imitation. Normal children displayed delayed imitation and sustained visual attention on the face and the activities of their parents. Disturbed children displayed no delayed imitation while being observed and concentrated their attention on certain features in their parents' presence, e.g., staring at and repetitively stroking the cheek of the father, and staring and manipulating a ring on the mother's hand. Two years after these children were observed, the retarded child was reported to be functioning at a higher level than any of the
disturbed children. Walters and Willows (1968) found no significant differences in imitation of aggression by disturbed and non-disturbed children. The disturbed children imitated the non-aggressive model less than the non-disturbed children. The term, disturbed, was not defined or qualified in these studies.

Five studies are described that do not include imitation; institutionalization and social reinforcement effects were explored with retarded subjects. Harter (1967) compared normal and retarded subjects in two groups, MA 5-1/2 and 8-1/2; with IQ 65, 100 and 130; and with two motivational conditions: standard (E out of sight) and social (E facing S). Acquisition was significantly more rapid with increased age and IQ. Social conditions facilitated acquisition for normal and for high IQ subjects. Standard conditions facilitated acquisition for retarded and for all children with MA 5-1/2. No systematic differences were associated with IQ among non-institutionalized groups of comparable MA. Institutionalized subjects were inferior to non-institutionalized mentally retarded subjects. Stevenson and Fehel (1961) reported the effects of social reinforcement on performance of institutionalized and non-institutionalized normal and retarded children. "Significant differences in increments of responses over the base rates were found as a function of institutionalization, but the variables of type of subject, type of game, and reward condition did not exert significant effects."
Stevenson and Cruse (1961) reported two experiments with normal and retarded children: In Experiment I, E made supportive statements every 15th response, E watched the performance and made no remarks, and E left the room after S began. Significant differences in the performance of similar simple repetitive tasks were observed between the normal and retarded for all three conditions, and significant differences were noted among the normals for the three different conditions. No significant differences prevailed among the retarded for the three conditions. In Experiment II, Conditions 1 and 2 were similar to those in Experiment I. Condition 3 was that E made critical comments. Results indicated significant differences in performance were associated with normal and retarded subjects and significant interaction was found between type of subject and experimental conditions.

Black and Thomas (1966) reported a study with 36 retarded subjects with a mean CA of 28.5 and mean MA of 3.3 on a discrimination learning task using three types of reward: 1) primary (food), 2) secondary (black discs that could be traded for candies), and 3) social (E saying "good," "fine," "good boy"). Performance was best for condition 2. Conditions 1 and 3 did not differ significantly. Baldwin (1967) compared the effectiveness of different reinforcers in a study with 96 retarded subjects: 1) tokens, 2) immediate food reinforcements, 3) social reinforcements, and
4) control, with the usual procedure. Pre- and post-treatment evaluations were made. All post-treatment evaluations were higher. The order of change was 1) food, 2) tokens, 3) control, and 4) social. Younger and lower IQ's exhibited more change with food reinforcers; older and higher IQ's exhibited more change with tokens. There was little difference in effects between control procedures and use of social reinforcement.
V. EXPERIMENTAL PROCEDURE

Subjects

The 19 severely retarded male subjects were residents of Columbus State Institute, Columbus, Ohio and ranged in age from 7-7 to 13-0 at the beginning of the study. The boys lived on "units" located in two different buildings. The buildings are about 1000 feet apart. Group 1 boys lived in one building; Group 2 boys lived in another building. The two groups of boys were not acquainted. The boys selected were judged to have no physical handicap that would interfere with their performance of overt imitative gestures and manipulations of blocks.

The Merrill-Palmer Scale of Mental Tests and the Vineland Social Maturity Scale were administered to each subject for selection and for pre- and post-experiment comparisons. The Experimenter administered the Merrill-Palmer and recorded data supplied by attendants for the Vineland Social Maturity Scale.

Models and reinforcements

Ten boys in Group 1 and nine boys in Group 2 were trained to criterion with the Experimenter as model. Criterion was stated to be five consecutive imitative performances with more than 90 percent of the forty presented gestures and manipulations performed on cues from the model, the Experimenter. The peer model with whom 16 of the subjects demonstrated transfer of imitative training, was a moderately mentally retarded boy who was 12 years, 5 months of age at the beginning of the study. The peer model was physically as large as the
largest subject. The peer model lived in the same building with Group 1 boys, but he lived on a different living unit. Contacts between the Group 1 boys and the peer model were limited and controlled during the experiment. Contacts between the Group 2 boys and the peer model were limited to the two occasions on which video tape recordings were made of their imitative performances.

Frequent reinforcements of all sorts were required at the beginning of training for each subject. In this study the term reinforcer or reinforcement means an object or activity controlled by the Experimenter or model that will induce the subjects to extend or exert effort in order to gain the object or activity. Some of the reinforcements used were candies, bits of sweetened cereal and cookies, smiling, nodding, patting the child on the shoulder or arm, and verbalizations like "Good," "Fine," "Good boy," etc. As training proceeded the use of food reinforcements and some other reinforcements were reduced and gradually faded. Near the end of training each subject was given one food reinforcement at the end of a performance only, in an adjoining room after a delay of several minutes. During criterion performances and when recordings were being made with the peer model, reinforcements consisted of smiling, nodding, and saying "Good," "Fine," and the subjects' names.

Activities to be imitated

Two sets of imitative activities were presented by the peer model: 1) twenty unique gestures were performed by the peer model in
the presence of each subject with the instruction, "Do this."
The order in which the peer model presented the gestures varied among subjects. The only cues observable to the subjects were the model's gestures. The gestures are described in Table 2.

2) twenty manipulations with wooden blocks and gestures were presented in the same sequential order to each subject by the peer model. Seven blocks in two different sizes were used to make two different block arrangements. Four blocks measuring approximately 3-1/2 x 2 x 1 inches and three blocks about 7 x 2 x 1/2 inches, were used. All the blocks were the same color. The model placed seven blocks for the subject to use and seven blocks for himself on the table. The blocks were placed in similar positions at the beginning of each trial. Each subject was trained to imitate the model's arrangements of the blocks and to make specified gestures when the arrangements were completed. The same sequential order was used for each subject. The ordered block arrangements and gestures are illustrated and described in Table 3 and Figures 1 and 2.

The use of video tape recordings to demonstrate the subjects' imitative behaviors was a decisive factor in determining the kinds of imitative activities that might be used in the study. The camera was kept stationary and was focused on approximately a cubic yard of space. The surface of a small table was the center of focus, with two chairs on either side of the table for a subject and the peer model, respectively. All gestures and manipulations were performed from a sitting position within the camera range.
<table>
<thead>
<tr>
<th>Slides (3rd recording)</th>
<th>Prints (4th recording)</th>
</tr>
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<tbody>
<tr>
<td>1  arms above head</td>
<td>fists with thumbs up</td>
</tr>
<tr>
<td>2  make fists</td>
<td>elbows on table</td>
</tr>
<tr>
<td>3  hands on shoulders</td>
<td>cover face with hands</td>
</tr>
<tr>
<td>4  forefinger across lips</td>
<td>point with arm extended</td>
</tr>
<tr>
<td>5  hands on head</td>
<td>palms of hands UP</td>
</tr>
<tr>
<td>6  &quot;eat&quot;</td>
<td>arms above head</td>
</tr>
<tr>
<td>7  shield eyes</td>
<td>clap hands</td>
</tr>
<tr>
<td>8  touch nose</td>
<td>forefinger across lips</td>
</tr>
<tr>
<td>9  touch ears</td>
<td>palms of hands DOWN</td>
</tr>
<tr>
<td>10 palms of hands UP</td>
<td>hands on head</td>
</tr>
<tr>
<td>11 &quot;sleep&quot;</td>
<td>&quot;brush teeth&quot;</td>
</tr>
<tr>
<td>12 fists with thumbs up</td>
<td>hands on shoulders</td>
</tr>
<tr>
<td>13 clap hands</td>
<td>&quot;sleep&quot;</td>
</tr>
<tr>
<td>14 &quot;brush teeth&quot;</td>
<td>touch ears</td>
</tr>
<tr>
<td>15 cover face with hands</td>
<td>&quot;drink&quot;</td>
</tr>
<tr>
<td>16 palms of hands DOWN</td>
<td>make fists</td>
</tr>
<tr>
<td>17 elbows on table</td>
<td>shield eyes</td>
</tr>
<tr>
<td>18 &quot;drink&quot;</td>
<td>touch nose</td>
</tr>
<tr>
<td>19 point with arm extended</td>
<td>hands on thighs</td>
</tr>
<tr>
<td>20 hands on thighs</td>
<td>&quot;eat&quot;</td>
</tr>
</tbody>
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For the 1st and 2nd recordings the above gestures were presented by the peer model in random order.
### TABLE 3
ORDER OF PRESENTATION OF SEQUENTIAL RESPONSES

<table>
<thead>
<tr>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>choose 2 short blocks</td>
</tr>
<tr>
<td>2</td>
<td>place 1st short block flat</td>
</tr>
<tr>
<td>3</td>
<td>place 2nd short block flat</td>
</tr>
<tr>
<td>4</td>
<td>space blocks appropriately, in line with model's.</td>
</tr>
<tr>
<td>5</td>
<td>span the 2 short blocks with 1st long block</td>
</tr>
<tr>
<td>6</td>
<td>place 2nd long block, one end on short block and other on table</td>
</tr>
<tr>
<td>7</td>
<td>place 3rd long block similarly to 6, but on opposite side</td>
</tr>
<tr>
<td>8</td>
<td>&quot;walk&quot; with fingers across long blocks</td>
</tr>
<tr>
<td>9</td>
<td>stack the three long blocks in their original positions</td>
</tr>
<tr>
<td>10</td>
<td>set 1st short block upright</td>
</tr>
<tr>
<td>11</td>
<td>set 2nd short block upright</td>
</tr>
<tr>
<td>12</td>
<td>span short blocks with one long block</td>
</tr>
<tr>
<td>13</td>
<td>set 3rd short block upright and on top, in line with 1st short block</td>
</tr>
<tr>
<td>14</td>
<td>set 4th short block upright and on top, in line with 2nd short block</td>
</tr>
<tr>
<td>15</td>
<td>span with 2nd long block</td>
</tr>
<tr>
<td>16</td>
<td>place 3rd long block on top of 2nd long block</td>
</tr>
<tr>
<td>17</td>
<td>look through opening in block arrangement</td>
</tr>
<tr>
<td>18</td>
<td>wave hand</td>
</tr>
</tbody>
</table>

The same order of presentation was used for all four recordings.
Figure 1: Block Design 1

Plan

Elevation
Training subjects

The standard, conventional methods of conditioning were used to train the subjects. The Experimenter went to the living unit for each subject to establish positive contact and control. Each subject was checked regarding his toileting, clothing, and appearance to forestall inconvenience and mishaps and to focus attention on the subject. During the walk to the experimental room the Experimenter directed each subject's attention to specific objects and activities to gain and to hold his attention. A small and relatively bare room was used for the experimental room. A small table, two chairs, and a box of blocks were located in the same respective positions for all trials. The Experimenter wore the same smock each session with pockets large enough to conceal necessary items, e.g., food reinforcers, keys, and tissues.

Each subject first was trained to open the door to the experimental room, turn on the lights, close the door, walk to his chair, and sit down. This was planned with the idea that the subjects would be actively participating and ready to proceed, and anticipation or set would be controlled. This preparatory procedure was quickly established by reinforcing with food and praise.

Looking directly at the subject, the Experimenter told each subject to "Do this" as she raised her arms above her head. Immediate reward followed noticeable movements of the subject’s arms. Encouragement with rapid reward for cooperative effort tended to establish the behavior. If the subject made no effort, the Experimenter assisted him by moving his hands or arms appropriately.
and rewarded him. Repeated trials were made until the child performed the gesture. For increased precision of performance, the Experimenter encouraged the subject and showed him a sweet reinforcer. On successive trials the subject was rewarded as more precise movements were demonstrated. Sensory-motor training at all levels followed this pattern. Variations of training were in size and type of increment changes and kinds of rewards, not in method.

Some gestures were learned in a few trials; some required many trials before they were performed on cue from the Experimenter's direction to "Do this" with accompanying demonstration of gestures or block manipulations. The subject's attention was a primary concern. If his attention waned or wandered, the training session was terminated as soon as the subject performed one additional task successfully and was rewarded. The last activity was consistently successful and rewarded in order to promote favorable motivation for the next session.

Training the peer model

The peer model was trained in a manner similar to the subjects. Additional verbal explanations were used, and then the roles were reversed with the Experimenter acting as a subject. For further practice several moderately mentally retarded boys and a newly admitted severely retarded boy acted as subjects with the peer model. With those experiences the peer model seemed comfortable and confident in his role as model.
The peer model was able to learn the sequence with the block arrangements and all the gestures; he was not successful in remembering and varying the order of presenting the twenty unique gestures. Several methods were tried for cueing him. The most efficient method was for the Experimenter to stand behind the subject's chair, both the subject and the Experimenter facing the model. The Experimenter cued the peer model as needed while the subject's attention remained focused on the model.

When recordings were made, the peer model met each subject outside the experimental room and walked with him into the room. The peer model directed each subject to his chair. As the subject and the peer model were sitting down, the Experimenter took her position behind the subject. With three exceptions, the peer model maintained each subject's attention and performed the model's share of activities, cueing and praising the subjects in an effective manner.

**Experimental conditions and recordings**

Training was completed and the first recordings with the peer model and Group 1 boys were made before training was started with Group 2 boys. When recordings were made, a camera and tripod, and a boy resident who operated the camera, were present in the room in addition to the peer model, the subject, and the Experimenter. The peer model, the camera operator, the camera, and the tripod had never been observed in the experimental room by any subject until the time of the first recordings. The multiple changes, particularly
the change to a peer model, constituted a large change for severely
er retarded subjects to encompass at one time. None of the subjects
were trained to imitate the peer model. The first recordings demon-
strated each subject's transfer of imitative responses from cues
provided by the Experimenter as model to cues presented by the peer
model.

Three boys failed to imitate the peer model. One Group 1 boy
would not stay seated. He kept jumping up and appeared to be over
excited and angry. Another Group 1 boy became hyperactive after
imitating several of the peer model's gestures. He laughed, clapped,
and tried to touch the camera, etc.; his attention could not be
controlled by the model. One boy in Group 2 sat quietly and stared
at the camera. With urging he made a few imitative responses then
reverted to staring.

The peer model maintained the attention of eight boys in Group
1 and eight boys in Group 2 for presentation of the forty gestures
and block manipulations. Each of these subject's imitative per-
formance of the peer model's behavior was recorded on video-tape on
two occasions: 1) after reaching criterion with the Experimenter as
model, and 2) twelve weeks later, without additional practice; other
conditions were similar to those in the first recording.

The primary experimental variables consisted of differences in
social contacts with the peer model by Group 1 and Group 2 subjects.
Group 2 boys had no contact with the peer model except on the two
occasions when recordings were made with him. Contacts with the peer model were controlled for boys in Group 1 as follows: the peer model lived in the same building in which Group 1 subjects lived; but the peer model lived in a different living unit, and had only a slight chance for social interaction with the subjects prior to the experimental experience. Beginning two weeks after the first recordings, Group 1 boys were isolated for a period of eight weeks because of possible exposure to an infection. All activities such as sleeping, eating, bathing, playing, etc., were restricted to their living unit, and only medical and attendant personnel were permitted to enter the unit. During the last two weeks of the isolation period, the peer model was observed by the Group 1 subjects through a window on six occasions. The peer model showed 6 different pets to the Group 1 boys on the six occasions. During the eleventh and twelfth weeks after the first recordings, each subject in Group 1 made a trip to a pet shop with the peer model and the Experimenter to select a pet. Each Group 1 boy assisted the peer model in showing the pet he helped select to other residents throughout the building. This activity required a little more than an hour for each Group 1 subject.

Sixteen weeks after the second video tape recordings, two more recordings were made of each subject in both Group 1 and Group 2 as he responded, or failed to respond, imitatively to pictures of the
peer model. These third and fourth recordings were made on the same day for each child. The pictures were presented in two forms: 1) Kodacolor prints approximately 3-1/2 x 4-1/2 inches, and 2) Kodachrome slides projected on a screen to approximately life-size. Twenty-five pictures were presented in each form. Twenty pictures showed the peer model performing the twenty gestures that had been varied in their order of presentation by the peer model when the previous two recordings were made. Five pictures displayed the peer model with the two block arrangements and performing gestures accompanying the completion of the arrangements. The order of presentation of the prints and of the slides was balanced for the subjects within each group. Half the boys in Group 1 were presented first with the prints and then with the slides; the other four boys were presented first with the projected slides, then the prints. Similarly, a balanced presentation of the prints and slides was shown Group 2 boys.

The third and fourth tape recordings showed the Experimenter sitting at a table with each subject. The Experimenter pointed to each picture presented, print and projected slide, and directed the subject to "Do like Chipper." The order of presentation within the set of prints and the set of slides was the same for all subjects. The order of the pictures within the first twenty pictures presented as prints differed from the order of those same twenty pictures presented as projected slides.
Ratings of imitative responses

Ratings were made of each of the sixteen subjects' imitative performances from recordings on video-tape. Four recordings were made for each subject; each recording demonstrated forty possible activities presented by the peer model or by pictures of the peer model, that each subject could imitate. Each subject's four recorded imitative performances were rated by three psychology graduate students on a 5-point scale.

The ratings were derived from a count of observed imitative responses cued by the peer model or by pictures of the peer model. The distribution of possible appropriately cued responses was as follows: First recording: 40 possible imitative responses; 20 of the peer model's cues varied in the order presented from subject to subject; 20 were presented in the same sequential order for each subject. Second recording: 40 possible imitative responses, as in the first recording. Third and fourth recordings: each subject's imitative responses were cued by pictures of the peer model performing gestures and block manipulations similar to those he did in person on the 1st and 2nd recordings. Forty possible responses were cued by 25 pictures presented as slides projected on a screen to near life-size; and 40 possible responses were cued by the same pictures presented as prints.
The four recordings occurred over time as follows:

First recording: after reaching imitative training criterion with the Experimenter; with the peer model.

Second recording: 12 weeks after the 1st recording; with the peer model.

Third and fourth recordings: 16 weeks after the 2nd recording; with pictures of the peer model presented as projected slides and as prints; both recordings were made on the same day for each subject.

Each subject's responses to viewing the 25 pictures, as slides and as prints, constituted the 3rd and 4th recordings. The cues to be imitated were provided by the pictures only. The Experimenter helped the subjects focus their attention by pointing to the pictures and instructing them to "Do like Chipper."

Of the 40 possible different responses, 20 responses were cued by 20 pictures, one response to each picture, as a slide and as a print; 5 pictures provided cues for 20 sequential responses which included two block arrangements with several manipulations in each arrangement.

Ratings were made on a 5-point scale for each of the four recordings of cued imitative responses as follows:

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Imitative responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 to 20%</td>
</tr>
<tr>
<td>2</td>
<td>21 to 40%</td>
</tr>
<tr>
<td>3</td>
<td>41 to 60%</td>
</tr>
<tr>
<td>4</td>
<td>61 to 80%</td>
</tr>
<tr>
<td>5</td>
<td>81 to 100%</td>
</tr>
</tbody>
</table>
VI. RESULTS

H-1 is rejected at less than the .002 level of significance. Sixteen severely-retarded boys demonstrated on the first trial transfer of imitative responses from cues provided by the Experimenter as model to cues provided by the peer model. The probability of successful stimulus generalization (responding to a similar but new stimulus model) was estimated to be .5 or p = q. Three boys did not transfer responses to the peer model. Using the table for the binomial distribution, 3 failures among 15 trials occur with .002 probability (Siegel, 1956, p 250). Three failures in 19 trials would occur at a probability of less than .002.

H-2 is accepted. The boys in Group 1 who demonstrated transfer of imitative responses to the peer model were rated similarly to the boys in Group 2 who demonstrated transfer of imitative responses to the peer model. The ratings within the two groups were variable, but the mean ratings of the two groups were the same.

H-3 is accepted. Twelve weeks after transfer to a peer model, Group 1 and Group 2 boys demonstrated responses to the peer model rated similarly to their responses 12 weeks earlier. Group 1 subjects received a mean rating of 13.875 on both occasions. Group 2 subjects' mean ratings were 13.875 and 14.5, respectively.

H-4 is accepted. The combined ratings of Group 1 and Group 2 boys did not significantly differ between those obtained on the
first trial with the peer model and those obtained 12 weeks later. The respective mean ratings were 13.875 and 14.1875.

H-5 is rejected at less than the .01 level of significance. Twenty-eight weeks after transfer to a peer model, in responses cued to pictures of the peer model, Group 1 boys demonstrated significantly higher ratings of imitative responses than Group 2 boys. Imitative responses to pictures of the peer model as slides projected to near life-size and as prints were rated. The losses, differences between imitative responses to the peer in person and imitative responses to cues provided by the slides and by the prints of the same pictures of the peer model, were analyzed. Statistical results using 2-way Analysis of Variance and the Wherry Test Selection Method disclosed a significant difference at less than the .01 level between Group 1 and Group 2 subjects in their imitative responses cued by the pictures.

H-6 is partially rejected. The t-test of the means of ratings received by Group 2 subjects in response to the pictures, as slides and as prints, differed significantly (at less than the .005 level) from mean ratings of Group 2 responses to the peer in person. The means were 6.75 and 6.875 for slides and prints, respectively, compared to 14.5 for the peer model in person.

Group 1 subjects demonstrated differences but they were not significant at the .05 level when responses to prints were compared
to responses to the peer model in person. There was a significant difference at the .05 level between ratings received with the peer model and in response to the slides projected to near life-size. The Group 1 means were 10.75 and 12.00 for slides and prints, respectively, and 13.875 for the peer model in person.

H-7 is accepted. There was no significant difference between ratings of responses to slides projected to near life-size and responses to prints of the same pictures. The means of the ratings were 8.75 and 9.4375, respectively. Analysis of Variance of losses of ratings on the two forms of the pictures and t-tests of the means of imitative ratings yielded no significant differences.

H-8 is accepted. No significant relationships were evidenced by pre- and post-experimental test results in predicting ratings of imitative responses.

The Wherry Test Selection Method was used to analyze the possible significance of chronological age, length of time institutionalized, and the ratings of the subjects' verbal ability as predictors of imitative response ratings. The verbal ratings of the subjects were significant at less than the .01 level of significance in predicting their imitative response ratings to the pictures, as slides and as prints. Chronological age and length of time institutionalized were not significant predictors.
<table>
<thead>
<tr>
<th>Description</th>
<th>Peer model in person</th>
<th>Pictures of peer model</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(slides)</td>
<td>(prints)</td>
<td></td>
</tr>
<tr>
<td>Time interval</td>
<td>0</td>
<td>+12 weeks</td>
<td>+28 weeks +28 weeks</td>
</tr>
</tbody>
</table>

**Group 1**

<table>
<thead>
<tr>
<th>Sum</th>
<th>111</th>
<th>111</th>
<th>86</th>
<th>96</th>
<th>404</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>13.875</td>
<td>13.875</td>
<td>10.75</td>
<td>12.00</td>
<td>12.625</td>
</tr>
<tr>
<td>Variance</td>
<td>1.609</td>
<td>2.109</td>
<td>12.438</td>
<td>11.00</td>
<td>8.56</td>
</tr>
<tr>
<td>SD</td>
<td>1.27</td>
<td>1.45</td>
<td>3.53</td>
<td>3.32</td>
<td>2.90</td>
</tr>
</tbody>
</table>

**Group 2**

<table>
<thead>
<tr>
<th>Sum</th>
<th>111</th>
<th>116</th>
<th>54</th>
<th>55</th>
<th>336</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>13.875</td>
<td>14.50</td>
<td>6.75</td>
<td>6.875</td>
<td>10.50</td>
</tr>
<tr>
<td>Variance</td>
<td>2.109</td>
<td>0.750</td>
<td>18.438</td>
<td>16.609</td>
<td>19.44</td>
</tr>
<tr>
<td>SD</td>
<td>1.45</td>
<td>0.866</td>
<td>4.29</td>
<td>4.075</td>
<td>4.8</td>
</tr>
</tbody>
</table>

**Total**

<table>
<thead>
<tr>
<th>Sum</th>
<th>222</th>
<th>227</th>
<th>140</th>
<th>151</th>
<th>740</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>13.875</td>
<td>14.1875</td>
<td>8.75</td>
<td>9.4375</td>
<td>11.5625</td>
</tr>
<tr>
<td>Variance</td>
<td>1.86</td>
<td>1.5</td>
<td>23.34</td>
<td>20.37</td>
<td>16.96</td>
</tr>
<tr>
<td>SD</td>
<td>1.36</td>
<td>1.23</td>
<td>4.83</td>
<td>4.51</td>
<td>4.12</td>
</tr>
</tbody>
</table>
### Table 5

**Analysis of Data: Wherry Test Selection Method**

<table>
<thead>
<tr>
<th>Description</th>
<th>Predictors</th>
<th>multiple r</th>
<th>shrunked r</th>
<th>DF</th>
<th>F value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable 10</td>
<td>Var. 4</td>
<td>.373</td>
<td>.279</td>
<td>1, 14</td>
<td>2.267</td>
</tr>
<tr>
<td>ratings:</td>
<td>Var. 4, 8</td>
<td>.499</td>
<td>.366</td>
<td>2, 13</td>
<td>1.903</td>
</tr>
<tr>
<td>Recording 2</td>
<td>Var. 4, 8, 2</td>
<td>.598</td>
<td>.443</td>
<td>3, 12</td>
<td>2.017</td>
</tr>
<tr>
<td>Variable 11</td>
<td>Var. 9</td>
<td>.707</td>
<td>.681</td>
<td>1, 14</td>
<td>13.963 *</td>
</tr>
<tr>
<td>rating difference</td>
<td>Var. 9, 2</td>
<td>.845</td>
<td>.819</td>
<td>2, 13</td>
<td>9.787 *</td>
</tr>
<tr>
<td>Recordings 2 - 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable 12</td>
<td>Var. 9</td>
<td>.705</td>
<td>.679</td>
<td>1, 14</td>
<td>13.806 *</td>
</tr>
<tr>
<td>rating difference</td>
<td>Var. 9, 2</td>
<td>.899</td>
<td>.883</td>
<td>2, 13</td>
<td>21.145 *</td>
</tr>
<tr>
<td>Recordings 2 - 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variable 9 = attendants' ratings of S's verbal ability (see Table 12)

Variable 2 = experimental group, social interaction effects

* Significant at less than the .01 level
TABLE 6
SUBJECTS' NON-EXPERIMENTAL DATA

<table>
<thead>
<tr>
<th>Subjects</th>
<th>CA 10/1/68 (mos.)</th>
<th>Merrill-Palmer Pre-MA change-pro-1 yr (mos.)</th>
<th>Vineland Soc. Mat. Scale Pre-SA change-pro-1 yr (mos.)</th>
<th>time insti. (mos.)</th>
<th>Attendants' Verbal Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bea</td>
<td>91</td>
<td>33 +4.8</td>
<td>28.8 +11.1</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>Bra</td>
<td>147</td>
<td>32 +0.8</td>
<td>49.2 +1.9</td>
<td>90</td>
<td>25</td>
</tr>
<tr>
<td>Coc</td>
<td>101</td>
<td>35 +2.4</td>
<td>54.0 -1.0</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>Den</td>
<td>117</td>
<td>44 +11.2</td>
<td>60.0 -1.9</td>
<td>41</td>
<td>25</td>
</tr>
<tr>
<td>Eut</td>
<td>156</td>
<td>37 +4.0</td>
<td>48.0 -5.8</td>
<td>31</td>
<td>8</td>
</tr>
<tr>
<td>Fun</td>
<td>97</td>
<td>38 +10.8</td>
<td>36.0 +11.0</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>Irv</td>
<td>149</td>
<td>27 +3.2</td>
<td>48.0 -6.7</td>
<td>73</td>
<td>8</td>
</tr>
<tr>
<td>Pru</td>
<td>105</td>
<td>36 +9.4</td>
<td>60.0 -3.8</td>
<td>18</td>
<td>17</td>
</tr>
</tbody>
</table>

DID NOT IMITATE PEER MODEL

| Nis      | 118               | 27                                          | 48.0                                                | 50                | 13                       |
| Lew      | 119               | 33                                          | 58.8                                                | 48                | 23                       |
TABLE 7

SUBJECTS' NON-EXPERIMENTAL DATA

<table>
<thead>
<tr>
<th>Subject</th>
<th>CA 10/1/68 (mos.)</th>
<th>Merrill-Palmer Pre-MA (mos.)</th>
<th>change-pro-1 yr (mos.)</th>
<th>Vineland Soc. Mat. Scale Pre-SA (mos.)</th>
<th>change-pro-1 yr (mos.)</th>
<th>Time insti. (mos.)</th>
<th>Attendants' Verbal Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bai</td>
<td>113</td>
<td>41</td>
<td>+4.0</td>
<td>32.4</td>
<td>+3.6</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>Bur</td>
<td>123</td>
<td>30</td>
<td>-1.0</td>
<td>39.6</td>
<td>-5.8</td>
<td>53</td>
<td>10</td>
</tr>
<tr>
<td>Don</td>
<td>148</td>
<td>39</td>
<td>+7.6</td>
<td>55.2</td>
<td>+2.2</td>
<td>80</td>
<td>22</td>
</tr>
<tr>
<td>Eri</td>
<td>110</td>
<td>31</td>
<td>0.0</td>
<td>21.6</td>
<td>+4.4</td>
<td>34</td>
<td>7</td>
</tr>
<tr>
<td>Far</td>
<td>100</td>
<td>25</td>
<td>+4.5</td>
<td>24.0</td>
<td>+14.2</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Ote</td>
<td>117</td>
<td>37</td>
<td>-3.0</td>
<td>42.0</td>
<td>+0.7</td>
<td>43</td>
<td>5</td>
</tr>
<tr>
<td>Pet</td>
<td>118</td>
<td>33</td>
<td>+9.1</td>
<td>45.6</td>
<td>+19.8</td>
<td>54</td>
<td>24</td>
</tr>
<tr>
<td>Wil</td>
<td>126</td>
<td>34</td>
<td>+3.0</td>
<td>45.6</td>
<td>+3.6</td>
<td>63</td>
<td>24</td>
</tr>
</tbody>
</table>

DID NOT IMITATE PEER MODEL

| McG     | 140               | 36                          |                        | 49.2                                  |                       | 53              | 16                     |
VII. DISCUSSION OF THE RESULTS

Sixteen boys imitated the peer model on the first trial. The three boys who did not imitate the peer model on the first trial were each given a second trial later, on the same or the succeeding day; no improvement was observed. The transfer from the Experimenter as model to the peer model is described in learning theory terms as stimulus generalization. The probability expressed in the null hypothesis of $p = q$ appropriately represented the expectancy of transfer of responses to the peer model. Stated non-statistically, the high degree of success on the first trials with the peer model was not anticipated. The results influenced the extension of the research period to study duration of imitative responses with further stimulus cue variations. A study in "naturalistic" setting extending over time, poses problems in advance planning. The less explored the area of study, the more dependent upon unanticipated circumstances the design may become.

The decision was made to drop the three boys who failed to transfer to the peer model from the study. Those three subjects could have been trained to imitate the peer model to criterion as was done previously with the Experimenter as model. But, if the three boys were trained with the peer model, the generalization effects would have no comparative value. For this study those
three boys demonstrated that some severely retarded boys did not exhibit stimulus generalization and did not respond imitatively to the peer model. The descriptive data of the three boys do not fall at the extremes of the ranges of the several dimensions reported, as recorded in Tables 6 and 7. From observing their behavior on video-tape, the Experimenter feels those boys failed to attend, or observe, the peer model. A way of viewing the imitative act can be described as follows: 1) attending to the stimulus, e.g., watching the peer model, not the camera, etc.; 2) perceiving or discriminating the relevant element of the stimulus, e.g., looking at the position of the peer model's hands; 3) perceiving the response, e.g., identifying and readying the similar part of his body for responding; and 4) overtly and recognisibly making the imitative response. Other views and other descriptions can be made of the imitative process, but the Experimenter used the above as a guide in training, etc. Attending is a necessary procedure in the sequence (Allport, 1937; Zeaman & House, 1963). If subjects do not attend, the subsequent behaviors do not occur within the few seconds time allowed for their display.

The twelve week lapse of time between the 1st and 2nd recordings did not appreciably alter the subjects' imitative ratings in response to the peer model. The peer model used social reinforcements only in all contacts with the subjects. Ratings were similar for both groups of subjects indicating high, stable retention of responses to stimulus generalization across a 12 week period of time.
The stability of imitative responses with stimulus generalization over a 12 week period for 16 subjects, led to further study of responses over time with further stimulus generalization. The peer model was photographed performing the gestures and block manipulations he used in the first two recordings. Each picture was made into a slide and a print. The 3rd and 4th recordings of the subjects’ imitative responses were cued by those pictures presented as slides projected to near life-size and as prints. This was an extension of stimulus generalization from live, active, 3-dimensional modeling to fixed, 2-dimensional modeling presented in two different forms with two widely differing sizes. The peer model returned to his home for the summer soon after the pictures were made, which controlled for the subjects' possible exposure to him.

Twenty-eight weeks after transfer of imitative responses to the peer model (16 weeks after last seeing the peer model), the subjects were rated for their responses to pictures of the peer model, presented as slides and as prints. There was no significant differences when ratings of responses to slides were compared to ratings of responses to prints of the same pictures. Comparison of severely retarded subjects' ability to discriminate from the same stimulus array presented in two widely differing absolute sizes has not been reported as far as the Experimenter is aware. The areal ratio between the two forms of the same pictures was
approximately 1 to 40. Severely retarded subjects have many more opportunities to view television or movies than to look at illustrations in magazines and books. It was not known beforehand whether severely retarded children would respond imitatively to non-reactive stimuli, to the 2-dimensional pictured representations of the peer model. If imitative responses did occur, it was postulated that the more familiar form of viewing 2-dimensional displays, and the absolute size of detail for cueing imitative behavior, would highly favor increased rates of responding to the slides projected to near life-size. The evidence strongly rejects even a tendency in that direction; the mean ratings for slides and for prints were 8.75 and 9.44, respectively. With less conviction than originally ventured, tentative speculation suggests that the relatively small size, maybe the relative novelty, of the prints required more attentiveness to detail which might produce slightly improved imitative responses. More likely, the differences can be attributed to chance.

Twenty-eight weeks after transfer of imitative responses to the peer model, imitative responses to pictures of the peer model were rated less than the responses to the peer model in person. The loss in ratings of imitative responses to the pictures was significantly greater for the Group 2 boys than for the Group 1 boys. The experimental variable of social interaction with the peer model
experienced by Group 1 boys only, significantly influenced their responses to cues provided by the pictures of the peer model. The 2-way Analysis of Variance of the rated losses was significantly different between the two groups at less than the .01 level of significance. Further statistical confirmation was supplied using the Wherry Test Selection Method.

The Wherry Test Selection Method tested the experimental variable and descriptive data (chronological age, time institutionalized, test results, and ratings of verbal ability) as predictors of imitative responses to the peer model and losses of ratings between responses to the peer model and to pictures of the peer model, as slides and as prints. Chronological age, time institutionalized, and test results were not predictive; ratings of verbal ability and the experimental variable of increased social interaction with the peer model experienced by Group 1 subjects only, were predictive of the losses (the differences) in ratings between imitative performance cued by the pictures and the peer model in person. The experimental variable of social interaction with the peer model experienced by Group 1 boys only, and the ratings of the subjects' verbal ability were significant at less than the .01 level of significance in predicting differences in imitative responses between the peer model in person and pictures of the peer model. The Wherry Test Selection Method includes a "shrunken r" which takes into account the sample size, 16 subjects, in predicting F values.
VIII. SUMMARY

Suggestions for further research

Further study of social reinforcements and social influence on acquisition and maintenance of activities and skills by retarded and emotionally disturbed children would advance our understanding both theoretically and for application in the institutional setting. The quality of social reinforcements will have to be considered. The literature is often vague as to what constitutes social reinforcements. Like "learning", social reinforcements may have to be evidenced through specified criteria of changes or performance levels to be termed reinforcement. Precise descriptions of the social reinforcements used and the prevailing circumstances are necessary to compare effects.

Emotionally disturbed children with poor social contact, could be trained for certain imitative activities or skills using food reinforcements, then the food reinforcers faded to predominantly social reinforcements. Ferster (1962) has described that technique in learning terms from clinical demonstrations. Eriksen's theoretical concept of basic trust appears to be demonstrated to some degree using that approach, providing for increasing levels of socialization. Pre- and postexperimental behavioral patterns could be recorded on video-tape, and modes of relating socially could be studied and evaluated in more detail.

Research study of imitative behavior varying both perceptual stimulus cues and response activities can provide meaningful insights.
for normal and atypical development. Variation in stimulus cues could include different absolute sizes, details, contrast, 2 or 3 dimensional displays, modalities, movement, reactivity or activity levels, color, rhythm, combinations of these, with verbal cues, etc. We might learn modes of exploring questions that are currently difficult to study, e.g., When does a toy doll or a toy animal represent a person or an animal? Are words necessary for that sort of identification? Recent animal studies have been reported of self-recognition by chimpanzees (Gallup, 1970). No comparable studies have been reported for human infants. Some severely retarded children do not appear to demonstrate self-recognition, but no studies are reported. Perceived similarity of body parts and movement would probably be evinced in both self-discrimination and early imitation studies.

Imitative responses could be studied as they spontaneously occur and, also, be educed by proffered rewards as Bandura (1965) did. Comparisons could be made of the results obtained under the two circumstances. Concrete and social, immediate and delayed or anticipated rewards, timing effects, measured time for performance, precision of imitation, variations of responses, and response generalization are some of the response variations that could be studied and could contribute for understanding aspects of the larger question: What influences children to imitate or not to imitate upon presentation of associated cues, previously established?

Perceptual responses could be inferred by using imitation as part of the experimental design. For young children 1 to 3 years of age,
little is known experimentally about their development of imitative abilities. Many children are available as subjects; baby-sitting or similar offers that are a convenience to the parents can be the means of gaining their consent. Basal imitative functioning could be established and new behaviors taught, e.g., a movement game. At the next interval of baby-sitting, the imitative performance could be repeated, new behaviors observed and noted, and an additional, new, imitative performance introduced. If such successive experiences could be video-taped over a period time for only a few subjects, an enormous range of developmental data of considerable value could be accumulated. Several graduate students as a group might collect data and combine their findings. Studying 2 or 3 children extensively for 6 months or a year in the home setting could be productive both for research and for professional experience. Graduate students with children could observe children not their own, and compile their findings.

Video-tape recordings of children made regularly between the ages of 1 and 2 years could provide insight into emergence, elaboration, and development of both verbal ability and overt, socially cued imitative ability. The high correlation between verbal ability ratings and ratings of imitative responses among the severely retarded subjects in this study suggests examining the effects of training for overt imitation on language development among retarded subjects who 1) have some speech, and 2) have no speech.
Social experiences of young children are important features of most developmental theories. Increasingly, early social activities are being reported and explored with varying experimental conditions (Foss, 1961, 1963, and 1965). Social interaction between two young children, 1 and 2 years old, has been observed by the Experimenter to cue reciprocally each child's imitative responses of pointing, naming objects or people (or using the sounds currently associated), dancing or moving rhythmically, picking up, grouping, and throwing objects, climbing, cuddling a doll, assuming various body positions, gesturing, etc. The 2 year old child imitated the awkwardness of the 1 year old child imitating the 2 year old. A report has limited value. Documented research is needed.

Anticipatory responses may be studied to learn, possibly, how imitation begins. The cues associated with eating and eliminating have been experimentally studied and applied in the training of severely retarded children. These basic functions could be studied in home settings with normal subjects along with concomitant social interactions.

Parents' reports of imitative and other behavioral activities of young children might be requested, seriously encouraged, and periodically checked for age range when first observed, varying levels of competency, situational conditions, etc. The biases presented may be no greater than those observed under conditions and with people unfamiliar to the children. An additional dimension, the parents' perceptions of their children, may emerge.
For generations anecdotes of family members' early social experiences have been recounted frequently displaying both humor and insight into early development. Studying the development of early life social processes further extends our appreciation of their diversity and fascination.

Conclusions

In the study presently being reported, the experimental data consist of ratings of subjects' appropriately cued imitative responses to the peer model and to pictures of the peer model. Four sets of video-tape recordings of the imitative behavior of each subject were made and rated. The interrater reliability was high; by replay of the recordings the small differences among raters could have been further reduced if desired.

Specifically, the findings of this research can be summarized as follows:
1) Sixteen severely retarded boys demonstrated imitative responses to cues provided by a peer model after being trained to imitate the Experimenter as model; for 10 gestures and block manipulations, ratings were made from video-tape recordings of each subject's cued responses.
2) Stimulus generalization of cued imitative responses was demonstrated with the peer model using social reinforcements only.
3) After a period of twelve weeks the subjects' imitative responses to cues provided by the peer model were similar to their responses initially demonstrated with the peer model.
1) Sixteen weeks after seeing the peer model (28 weeks after initially imitating the peer model) imitative responses to cues provided by pictures of the peer model were rated significantly higher for Group II boys. Group I boys only had a number of controlled social experiences with the peer model prior to the 2nd recordings, made 12 weeks after initially imitating the peer model. Group 2 boys saw the peer model only when the 1st and 2nd recordings were being made.

5) Imitative responses to pictures presented as slides projected to near life-size were rated similar to imitative responses to the same pictures presented as prints. The areal ratio of the two forms of the same pictures was approximately 40 to 1.

6) Verbal ability ratings for each subject made by 5 attendants, and the social interaction with the peer model experienced by Group 1 boys only, were predictive of imitative responses to pictures of the peer model.

7) Chronological age, time institutionalized, mental age, and social age were not significant predictors of imitative responses to pictures of the peer model.

The use of video-tape was expensive in terms of materials, equipment, and the personnel and time required for both recording and rating. However, the advantages of using video-tape recordings outweighed the cost in the opinion of the Experimenter. The experimental evidence is apparent, though it remains open to differing interpretation and rating or evaluation. The original data are permanent, if properly stored. Replay and stopping to focus can sharpen and pinpoint behaviors. It is possible for more research to be produced
from the same behavioral data; some new hypotheses suggested by anal-
ysis of the data, can be explored. Time factors related to responses
can be measured when convenient, and measured more accurately.

For this study few features of the potential advantages of using
video-tape were exploited. Pretraining tapes made of the subjects'
behavior and progressive taping throughout training would have de-
monstrated areas of ineffectiveness and success. By using tape
recordings for training and research, the relative effectiveness of
methodology (the applied aspects) can be studied concomitantly with
research of more theoretical issues. The combination of available
equipment and personnel for recording, and the institutional setting
for control of environmental variables and source of experimental
subjects can contribute to current knowledge of behavior and provide
records for further comparisons later in time. Most valuable in the
Experimenter's opinion is the opportunity such data present in allow-
ing repeated review of the objective evidence so that areas of agree-
ment and of disagreement relative to interpretation and evaluation
can be pinpointed for discussion and understanding of divergent per-
spectives and opinions. Possibly scientific study of behavior can
be both more precise and more open through fuller use of various
mechanical, electrical, electronic, and other means currently avail-
able for use.
FIGURE 3 COLUMBUS STATE INSTITUTE, OHIO, AND U.S.A.

INSTITUTIONALIZED POPULATION: LEVELS OF RETARDATION

= U.S.A.
= Ohio
= C.S.I.

FIGURE 4  INITIAL BLOCK ARRANGEMENT ON TABLE
<table>
<thead>
<tr>
<th>Recording</th>
<th>Peer Model in Person</th>
<th>Pictures of Peer Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bea</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Bra</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Coc</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Den</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Eut</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Fun</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Irv</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Pru</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bai</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Bur</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Don</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Eri</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Far</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Ote</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Pet</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Wil</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>
## TABLE 9
RATING LOSSES: TWO-WAY ANALYSIS OF VARIANCE

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of squares</th>
<th>Degrees of freedom</th>
<th>Mean square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Group 1 and Group 2</td>
<td>215.3</td>
<td>1</td>
<td>215.3 *</td>
</tr>
<tr>
<td>Between slides and prints</td>
<td>3.7</td>
<td>7</td>
<td>.5</td>
</tr>
<tr>
<td>Interaction</td>
<td>2.7</td>
<td>7</td>
<td>.4</td>
</tr>
<tr>
<td>Within sets</td>
<td>359.0</td>
<td>16</td>
<td>22.4</td>
</tr>
</tbody>
</table>

* Significant at less than the .01 level
### TABLE 10

**RATINGS OF IMITATIVE RESPONSES**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>1st recording</th>
<th>2nd recording</th>
<th>3rd recording</th>
<th>4th recording</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  S  Z  TOT</td>
<td>M  S  Z  TOT</td>
<td>M  S  Z  TOT</td>
<td>M  S  Z  TOT</td>
</tr>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bea</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>4  5  5  14</td>
<td>4  4  4  12</td>
</tr>
<tr>
<td>Fun</td>
<td>5  5  4  14</td>
<td>4  4  4  12</td>
<td>4  4  4  12</td>
<td>3  3  3  9</td>
</tr>
<tr>
<td>Coc</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>4  4  5  13</td>
<td>4  4  4  12</td>
</tr>
<tr>
<td>Pru</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
</tr>
<tr>
<td>Den</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>5  4  5  14</td>
</tr>
<tr>
<td>Bra</td>
<td>4  4  4  12</td>
<td>4  4  4  12</td>
<td>3  4  4  11</td>
<td>3  3  3  9</td>
</tr>
<tr>
<td>Irv</td>
<td>4  4  4  12</td>
<td>4  4  4  12</td>
<td>1  2  1  4</td>
<td>1  1  1  3</td>
</tr>
<tr>
<td>Eut</td>
<td>5  4  4  13</td>
<td>5  5  5  15</td>
<td>4  4  4  12</td>
<td>4  4  4  12</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Far</td>
<td>4  4  4  12</td>
<td>5  5  5  15</td>
<td>1  1  1  3</td>
<td>1  1  1  3</td>
</tr>
<tr>
<td>Eri</td>
<td>4  4  4  12</td>
<td>4  4  5  13</td>
<td>2  2  2  6</td>
<td>2  2  2  6</td>
</tr>
<tr>
<td>Bai</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>1  1  1  3</td>
<td>1  1  1  3</td>
</tr>
<tr>
<td>Ote</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>1  1  1  3</td>
<td>1  1  1  3</td>
</tr>
<tr>
<td>Pet</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>4  4  4  12</td>
<td>4  4  4  12</td>
</tr>
<tr>
<td>Bur</td>
<td>4  4  4  12</td>
<td>4  5  5  14</td>
<td>1  1  2  4</td>
<td>1  1  1  3</td>
</tr>
<tr>
<td>Wil</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>4  4  4  12</td>
<td>3  4  3  10</td>
</tr>
<tr>
<td>Don</td>
<td>5  5  5  15</td>
<td>5  5  5  15</td>
<td>4  4  4  12</td>
<td>4  5  5  14</td>
</tr>
</tbody>
</table>

1 = 0 to 20%
2 = 21 to 40%
3 = 41 to 60%
4 = 61 to 80%
5 = 81 to 100%
## Table 11

**Order of Presentation of Slides and Prints**

<table>
<thead>
<tr>
<th>Presented First</th>
<th>3rd Recording</th>
<th>4th Recording</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prints</td>
<td>Slides</td>
</tr>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pru</td>
<td>15</td>
<td>Den</td>
</tr>
<tr>
<td>Bea</td>
<td>12</td>
<td>Coc</td>
</tr>
<tr>
<td>Irv</td>
<td>3</td>
<td>Fun</td>
</tr>
<tr>
<td>Eut</td>
<td>12</td>
<td>Bra</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bai</td>
<td>3</td>
<td>Pet</td>
</tr>
<tr>
<td>Wil</td>
<td>10</td>
<td>Bur</td>
</tr>
<tr>
<td>Ote</td>
<td>3</td>
<td>Don</td>
</tr>
<tr>
<td>Far</td>
<td>3</td>
<td>Eri</td>
</tr>
<tr>
<td><strong>Presented Second</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Den</td>
<td>14</td>
<td>Pru</td>
</tr>
<tr>
<td>Coc</td>
<td>12</td>
<td>Bea</td>
</tr>
<tr>
<td>Fun</td>
<td>9</td>
<td>Irv</td>
</tr>
<tr>
<td>Bra</td>
<td>9</td>
<td>Eut</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pet</td>
<td>12</td>
<td>Bai</td>
</tr>
<tr>
<td>Bur</td>
<td>3</td>
<td>Wil</td>
</tr>
<tr>
<td>Don</td>
<td>14</td>
<td>Ote</td>
</tr>
<tr>
<td>Eri</td>
<td>6</td>
<td>Far</td>
</tr>
</tbody>
</table>
### TABLE 12
RATINGS AND RANKING FOR VERBAL ABILITY BY 5 ATTENDANTS

<table>
<thead>
<tr>
<th>GROUP 1</th>
<th>Subject</th>
<th>rating</th>
<th>rank order</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bea</td>
<td>14</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bra</td>
<td>25</td>
<td>1</td>
<td>0-makes no sound</td>
</tr>
<tr>
<td></td>
<td>Coc</td>
<td>13</td>
<td>6</td>
<td>1-makes sound only</td>
</tr>
<tr>
<td></td>
<td>Den</td>
<td>25</td>
<td>2</td>
<td>2-says 1 to 5 words, inappropriately</td>
</tr>
<tr>
<td></td>
<td>Eut</td>
<td>8</td>
<td>8</td>
<td>3-says 1 to 5 words, appropriately</td>
</tr>
<tr>
<td></td>
<td>Fun</td>
<td>14</td>
<td>5</td>
<td>4-uses phrases, appropriately</td>
</tr>
<tr>
<td></td>
<td>Irv</td>
<td>8</td>
<td>7</td>
<td>5-uses short sentences</td>
</tr>
<tr>
<td></td>
<td>Pru</td>
<td>17</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Nis</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Lew</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| GROUP 2 | Bai     | 5      | 8          | |
|         | Bur     | 10     | 4          | |
|         | Don     | 22     | 2 (note)   | |
|         | Eri     | 7      | 6          | |
|         | Far     | 10     | 5          | |
|         | Ote     | 5      | 7          | |
|         | Pet     | 24     | 1          | |
|         | Wil     | 24     | 3          | |
|         | *McG    | 16     |            | *Did not imitate peer model.
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