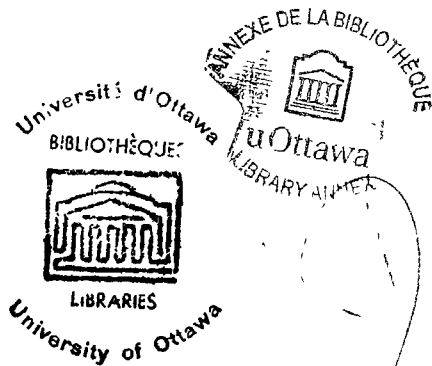


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INCIDENTAL IMITATION IN SOCIAL LEARNING

by Paula J. Yanne

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and Education of the University of Ottawa as
partial fulfillment of the requirements for
the degree of Master of Arts in Education.



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CURRICULUM STUDIORUM

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INTRODUCTION

Imitation is a familiar phenomenon among the categories of human behavior as seen when the child first learns to walk and to talk. The fact that children seem to repeat the behavior of adults so spontaneously gives rise to the erroneous notion that imitation is innate, an instinctive or constitutional process or propensity. Such an unscientific assumption could be dismissed by Guthrie's humorous remark that if imitation were instinctive, then "all conversations would be duets, and bus drivers as well as incoming passengers would keep dropping fares into the fare box."¹

The importance of imitation as a process of learning received its due notice with Miller and Dollard's publication of Social Learning and Imitation² in 1941. Research in this field, however sparing, was directed toward the validation of Miller and Dollard's theory of imitation as a form of instrumental conditioning. Within the last decade, under the leadership of Bandura, research in the field of imitation has opened up new vistas. Not only has the mechanism of imitation been treated analytically, but emphasis has been given to its

¹ E.R. Guthrie and F.F. Powers, Educational Psychology, New York, Ronald Press, 1950, p. 66.

² N.E. Miller and J. Dollard, Social Learning and Imitation, New Haven, Yale University Press, 1941, xiv-341 p.

effectiveness in bringing about desirable as well as unacceptable social behavior. Its power lies in its subtlety which can escape the most rigid control. Man, living in a diversity of social environment, could not wall off any elements which might be detrimental to the development of his character, nor that of his children. In fact, it is not a question of living in isolation but a bold acceptance of the interaction of various social forces with fortitude and internalized value.

The present study takes the socio-behavioristic approach as Bandura and Walters did in Social Learning and Personality Development,³ investigating the phenomenon of imitation in a social context with objectively observable data. It is concerned with the occurrence of imitation at different age levels. According to the theory of Miller and Dollard, it would seem that along the continuum of development, imitation decreases as the individual begins to have independence of judgment. On the other hand, according to the theory of Bandura and Walters, imitation as observational learning, would increase with age as the individual develops keener power of observation.

³ A. Bandura and R.M. Walters, Social Learning and Personality Development, New York, Holt, Rinehart and Winston, 1963, ix-329 p.

In the review of the literature, Chapter I covers the experimental and theoretical groundwork published by Bandura and his associates. It also presents other investigations which are related to the work of Bandura. Chapter II deals with the experimental set-up and its procedures for the purpose of testing the hypothesis of age differences. Chapter III presents the results of the experiment and the statistical analysis of the data and discussion of these findings. Finally, in the conclusion, there is a summary of the research project and suggestion for further research.

CHAPTER I

REVIEW OF THE LITERATURE

The theories of imitation are diverse and are of opposing views. However, one common element is that all types of imitation are essentially of a social nature since there are two persons involved: an imitator and an imitatee. Currently, these two terms are often replaced by a 'model' and a 'subject' in the experimental setting, or a 'model' and a 'learner' in a broader learning situation.

The review of the literature shows the necessary conditions for imitation to occur and also a number of variables which affect the amount of imitation. It leads to an interest in studying the subject-variable of age differences.

1. Imitation as Observational Learning.

Imitation was described by Bandura as observational learning whereby "subjects combine fractional responses into relatively complex novel patterns solely by observing the performance of social models."¹ Particularly within the context of social learning, it was felt that much of the

¹ A. Bandura, "Social Learning Through Imitation", in Nebraska Symposium on Motivation, M.R. Jones (Ed.), Lincoln, University of Nebraska Press, 1962, p. 216.

response repertoire was acquired by imitation. The transmission of cultural behavior, table-manners, for example, was carried out more often without explicit instructions from the parents. This tendency to imitate was developed very naturally since during the early years of life, children were very dependent on their parents, especially the mother who was the source of nurturance and affection. In order to retain the mother's attention which was rewarding, the child learned to do the same thing her mother did which brought with it an additional secondary reward, namely, the mother's delight at the child's imitation of her behavior. Self-administered disapproval or criticism following misbehavior tended not only to obtain parental forgiveness but also to secure their love and praise which further reinforced the child's imitation of the value system of the parent. In still another way, the child imitated the parental expression of affectionate behavior which brought to their mind the image of the parent's love and care and this, though imagined under pretense, was rewarding. Therefore, "through the repeated association of imitative behavior with reward, the child becomes motivated to behave like the parent."²

Bandura further stated that "in order for imitative responses to occur, the model's behavior must be within the

2 A. Bandura and R.H. Walters, Adolescent Aggression, New York, Ronald Press, 1959, p. 254.

perceptual and motor capacity of the observing organism."³ If to teach was to show⁴ then to learn was to perceive. This type of observational learning had supporting evidence in experimentation with animals. Warden and associates⁵ found that the cebus and the rhesus monkeys were able to solve their problem, after watching a trained monkey solving the same problem, in less time than required by the ordinary method of trial-and-error. The authors referred to this type of observational learning as imitation which, in their opinion, would not occur among the subprimate forms. However, Herbert and Harsh reported that "on problems within their normal range of ability, cats benefit from observing the learning process of another cat."⁶ It was emphasized that observing the skilled performances alone was not as beneficial as observing the learning process itself and that the effectiveness of observational learning was limited by the perception of the problem. With regard to this aspect

3 A. Bandura, "Social Learning Through Imitation", p. 257.

4 Ibid., p. 214.

5 C.J. Warden and T.A. Jackson, "Imitative Behavior in the Rhesus Monkey", in Journal of Genetic Psychology, Vol. 46, No. 1, 1935, p. 103-125. Also C.J. Warden, H.A. Fjeld and A.M. Koek, "Imitative Behavior in Cebus and Rhesus Monkeys", in Journal of Genetic Psychology, Vol. 56, No. 2, 1940, p. 311-322.

6 J.J. Herbert and C.M. Harsh, "Observational Learning by Cats", in Journal of Comparative Psychology, Vol. 37, No. 1, 1944, p. 95.

of observational learning, Hayes and Hayes⁷ reported that the imitative ability of a three-year-old chimpanzee which lived in their household, was very similar to that of a three-year-old human child.

Wilson treated imitation as a learning process by which an individual attempted to perform an act through observation of the behavior of another. Its two components were the learning of a new response by matching or copying a model's response, and the performance of the response at another time in another place without the model being present. It was postulated that since imitation was observational learning, it was possible for the learner, while following a primary cue, to learn to follow an incidental cue. His experimental data showed that

preschool children while utilizing a model's response as a primary cue for the performing of that same response did learn, in the absence of instruction, a secondary 'incidental' cue for the performance of that response.⁸

Church's experimentation with rats showed that the learner-rats, having been trained to follow a leader-rat, were able to learn to follow a light cue in the absence of

7 K.J. Hayes and C. Hayes, "Imitation in a Home-raised Chimpanzee", in Journal of Comparative Physiology and Psychology, Vol. 45, No. 5, 1952, p. 450-459.

8 W.C. Wilson, "Imitation and the Learning of Incidental Cues by Preschool Children", in Child Development, Vol. 29, No. 3, 1958, p. 396.

the leader-rat. The leader-rat was the primary cue while the light was the incidental cue. Since the learning of a primary cue did not interfere with the learning of an incidental cue, Church speculated on "the possibility of a nonpurposive transmission of culture among animals."⁹ This transmission, theoretically speaking, should be able to be transmitted from one generation to another.

Berger theorized that ready-made attitude and emotional response might be transmitted through observational learning as it was generally recognized that "the emotional responses of one person (performer) may elicit emotional responses from another (observer)."¹⁰ Berger tested three types of emotional responses: empathy or identification, envy and sadism. Since all these three types of emotional responses of the observer were contingent upon the emotional responses of the model, the observer must first perceive the model's emotional responses and then experience such responses vicariously before he could emit any similar emotional responses.

In a series of experiments, Bandura and associates were able to demonstrate that by exposure to life-models,

⁹ R.M. Church, "Transmission of Learned Behavior between Rats", in Journal of Abnormal and Social Psychology, Vol. 54, No. 2, 1957, p. 165.

¹⁰ S.M. Berger, "Conditioning through Vicarious Instigation", in Psychological Review, Vol. 69, No. 5, 1962, p. 450.

film-models, or pictorial presentation in the form of cartoons, children learned the solution of a problem and also the behavioral characteristics of these models. Bandura and Huston¹¹ reported that children, having identified themselves with the model, reproduced part or all of the behavioral traits of the model in the testing situation even though these behaviors were irrelevant to the successful solving of the problem. Bandura, Ross and Ross¹² found that children were able to generalize to a new situation the aggressive behavior they had previously learned through observation of a life-model. In another study¹³ the same authors showed that film-mediated aggressive models were as effective as life-models in stimulating aggressive behavior. Furthermore, because of the close similarity of the expression of aggression between the subjects and the models, the authors suggested

11 A. Bandura and A.C. Huston, "Identification as a Process of Incidental Learning", in Journal of Abnormal and Social Psychology, Vol. 63, No. 1, 1961, p. 311-318.

12 A. Bandura, D. Ross and S.A. Ross, "Transmission of Aggression through Imitation of Aggressive Models", in Journal of Abnormal and Social Psychology, Vol. 63, No. 3, 1961, p. 575-582.

13 A. Bandura, D. Ross and S.A. Ross, "Imitation of Film Mediated Aggressive Models", in Journal of Abnormal and Social Psychology, Vol. 66, No. 1, 1963, p. 3-11.

that "film aggression, not only facilitated the expression of aggression, but also effectively shaped the form of the subjects' aggressive behavior."¹⁴

2. Sensory-contiguity Theory.

Stated in its simplest form, observational learning which Bandura named imitation or imitative learning, posited a "contiguous sensory stimulation as a sufficient condition for the acquisition of most forms of matching responses."¹⁵ A distinction ought to be made between learning and performance. Learning is a mental process which is manifested in performance; only the latter is observable and therefore measurable. A child might have learned a behavior through exposure to a film, for instance, but for one reason or another, did not perform the same act. The post-experimental interviews with children exposed to filmed aggression led Bandura, Ross and Ross to conclude that the children "had acquired the cognitive equivalents of the model's behavior although this learning was not translated into the corresponding overt motoric responses."¹⁶ In this respect, Maccoby was of the

¹⁴ Ibid., p. 9.

¹⁵ A. Bandura, "Social Learning through Imitation", p. 264.

¹⁶ A. Bandura, D. Ross and E.A. Ross, "Vicarious Reinforcement and Imitative Learning", in Journal of Abnormal and Social Psychology, Vol. 67, No. 6, 1963, p. 606.

opinion that though much of a child's behavior was acquired through instrumental conditioning, yet

concurrently the young child is acquiring a repertoire of behavior through a different process: that of practicing covertly the characteristic actions of other people with whom he interacts.¹⁷

Not all that the child had learned would find expression in overt behavior; it remained in latency until such a time and in such a situation when it was called forth to its overt manifestation.

If contiguous sensory stimulation was a sufficient condition for the acquisition of matching responses, it would seem that "our minds would be too cluttered with incidental imitative relationships gathered from all animals, human and otherwise, that ever crossed our sensory paths ..."¹⁸ Some other determinants were necessary and Epstein suggested the following: attention, motivation and past-learning. Bandura himself had recognized such variables as the "subject and model characteristics, stimulus programming, rate and mode of presentation, motivational variables, reinforcement and set-inducing operations"¹⁹ which would affect the amount of

17 E.E. Maccoby, "Role-taking in Childhood and Its Consequences for Social Learning", in Child Development, Vol. 30, (no number), 1959, p. 234.

18 S. Epstein, "Comments on Dr. Bandura's Paper", in Nebraska Symposium on Motivation, M.R. Jones (Ed.), Lincoln, University of Nebraska Press, 1962, p. 270.

19 A. Bandura, "Social Learning through Imitation", p. 264.

imitative learning and the level of performance. Bandura was insistent that these variables were to be "regarded as facilitative rather than as necessary preconditions for the occurrence of imitative learning."²⁰

3. Nurturance and Identification.

In testing these variables, Bandura and Huston found evidence for nurturance as a factor facilitating imitative learning. Children were more imitative of the model who had been warm and rewarding; with a model who was relatively distant and cold, children were less imitative.²¹ Once this nurturance interaction had been established, the withdrawal of nurturance only instigated the children to imitate more the behavior of the model, as in the case of the natural relationship between mother and child. This phenomenon had its explanation in the mechanism of identification in the theories of personality. Bandura treated these two concepts as synonymous "since both encompass the same behavioral phenomenon, that is, the tendency for a person to match the behavior or attitude as exhibited by actual or symbolized models."²²

20 A. Bandura, loc. cit.

21 A. Bandura and .C. Huston, op. cit., p. 311-318.

22 A. Bandura, op. cit., p. 215.

Mowrer was more specific and distinguished two kinds of identification: developmental and defensive. Developmental identification represented the "attempt on the part of the infant to reproduce bits of the beloved and longed-for parent." Defensive identification was "based upon an attempt to resolve intolerable conflict produced by the disciplinary action of parents."²³ Developmental identification was a truer type of imitation than defensive identification because the mediating agent, such as the parent, served to reduce a need of the infant thus bringing about primary as well as secondary reward for the infant.

Based on the Freudian assumption that separation from the mother or loss of the mother's love motivated the child to seek to reinstate that closeness and affection, Hartup investigated the nurturance-withdrawal and nurturance-consistency in mixed groups of boys and girls. He found that withdrawal of nurturance definitely raised the rate of learning for girls, although there was no significant difference between the two groups as a whole. However, it was speculated that probably nurturance-withdrawal would also stimulate faster learning for boys if there were taken into consideration such "second- or third-order interaction between nurturance-

23 O.H. Mowrer, Learning Theory and Personality Dynamics, New York, Ronald Press, 1950, p. 615.

withdrawal, sex of child, sex of experimenter, and dependence which influenced the behavior of boys."²⁴

4. Theories of Identification and Imitation.

The theories of identification are legion: Hill²⁵ cited ten different uses of the term by different theorists. Furthermore, other terms are used interchangeably, such as, identification, introjection, and internalization in describing the process of the development of value system and conscience. Yet such confusion over the use of terminologies could neither be resolved by redefinition of the old terms nor by introduction of new terms. In relation to imitation, Bandura and Walters wrote, "observational learning is generally labelled 'imitation' in experimental psychology and 'identification' in theories of personality."²⁶ Another confusing term is 'role-playing' which, in developmental psychology, is the process in acquiring adult behavior for later display through imitation.

²⁴ W.W. Hartup, "Nurturance and Nurturance-Withdrawal in Relation to Dependency Behavior of Preschool Children", in Child Development, Vol. 29, No. 2, 1958, p. 200.

²⁵ W.F. Hill, "Learning Theory and the Acquisition of Values", in Psychological Review, Vol. 67, No. 5, 1960, p. 317-318.

²⁶ A. Bandura and R.M. Walters, Social Learning and Personality Development, New York, Holt, Rinehart and Winston, 1963, p. 91.

Bandura, Ross and Ross designed a study to test three theories of identification: the status envy - watching a model who was the consumer of rewards; the power theory - watching a model who was the dispenser of rewards; and the secondary reinforcement theory - watching a model who mediated the child's physiological and social rewards. The results showed strong evidence in support of "the social power theory of imitation (...), the model who possessed rewarding power was imitated to a greater degree than was the rival or the ignored model."²⁷ However, this was in contrast to Whiting's cross-cultural study which supports the theory of status envy, in that "rivalry between father and child and early socialization combine to produce the strong internalization of moral values and readiness to accept blame."²⁸ This process of internalization could very well be identification, as Whiting and Child wrote that since the child is dependent upon the parent, especially for love and approval, he learned, during his early process of socialization, to appraise the value system in the same manner as his parents, and he

27 A. Bandura, D. Ross and C.A. Ross, "A Comparative Test of the Status Envy, Social Power, and Secondary Reinforcement Theories of Identificatory Learning", in Journal of Abnormal and Social Psychology, Vol. 67, No. 6, 1963, p. 531.

28 J.W.M. Whiting, "Sorcery, Sin, and the Superego: a Cross-cultural Study of Some Mechanisms of Social Control", in Nebraska Symposium of Motivation, M.R. Jones (Ed.), Lincoln, University of Nebraska Press, 1959, p. 193.

administered to himself the approval or blame which his parents would apply even though they were not present to witness his behavior. The more the parental love was withdrawn when that love was needed, the more the child would identify himself with his parents through imitation. And the more approval for the imitative behavior from the parents, the more strongly was established the identification.

"Identification (...) becomes a means of retaining love in a substitute form by playing the nurturant and loving role of the lost person."²⁹

The bridge between identification and role-playing or role behavior, found other builders in Sears, Maccoby and Levin. Identification was role-practice³⁰ with the motive of either to reproduce some pleasant experience or to reduce the worry about having parental affection and approval or not. Imitation could be very rewarding because in reproducing the rewarding behavior of the parents, the child not only obtained the reward which accompanied such behavior but also the secondary reward of parental approval. Therefore, imitation was dependent upon the strength of identification which was motivated by the child's dependency on his parents. It would

²⁹ J.W.M. Whiting and I.L. Child, Child Training and Personality, New Haven, Yale University Press, 1953, p. 261.

³⁰ R.R. Sears, E.E. Maccoby, and H. Levin, Pattern of Child Learning, Brunner, Co. and Peterson, 1957, p. 370.

be a logical assumption "that the child-rearing practices of mothers are significant determinants of these various developments in the child."³¹

Maccoby and Wilson proposed another^{er} determinant of identification: in viewing film-models, the behavioral responses a viewer learned were determined by the character with whom he chose to identify himself. By identification, the authors mean "... the viewer, in fantasy, puts himself in the place of a character and momentarily feels that what is happening to that character is happening to himself."³² For Parsons, identification had two phases: during the stage of oral dependency when the mother-child identity was established with the child perceiving the mother as the object of resource, the dispenser of need-satisfaction, and therefore, acquiring an attachment to the mother with a sense of dependency. During the oedipal phase when the family constellation had increased from the two member relationship of mother and child to the four or more member relationship of parents and children, identification, taken to "designate the process of internalization of any common collective 'we-categorization'

31 Ibid., p. 375.

32 E.E. Maccoby and W.C. Wilson, "Identification and Observational Learning from Film", in Journal of Abnormal and Social Psychology, Vol. 55, No. 1, 1957, p. 76.

and with it the common values of the requisite collectivity,"³³ took on three distinctive types: the internalization of the familial we-category, the sibling category, and the sex-role category.

Mussen and Distler distinguished three stages in the process of identification: developmental, defensive and role-taking. To begin with, both boys and girls first identified themselves with their mother who was the source of nurturance and love-gratifying. As they grow older girls continued to identify themselves with their mother while the boys had to shift their identification to their father for a normal development of their personality. Defensive identification took place in cases where the fathers were more punitive and threatening and this led to the third stage of identification, that of role-taking, where "the child is most likely to assimilate the role of an individual with whom he had intensive interactions, especially if this individual is powerful."³⁴

This had been the vicious circle of the various types of identification and role-playing in relation to imitation. Although the strength of the identification modified the

³³ T. Parsons, "Family Structure and the Socialization of the Child", in Family, Socialization and Interaction Process, T. Parsons and R.F. Bales (Ed.), Glencoe, Free Press, 1955, p. 93.

³⁴ P. Mussen and L. Distler, "Masculinity, Identification, and Father-Son Relationship", in Journal of Abnormal and Social Psychology, Vol. 59, No. 3, 1959, p. 356.

amount of imitation, yet role-taking and imitation were not synonymous because "role-taking is imitation, but not all imitation is role-taking."³⁵ And the antecedents of role-taking though not entirely clear, seemed to be "a categorical label, applied by others or by the person himself."³⁶ For a child, imitation was said to be role-taking when that role, naturally speaking, belonged to others but was assumed by him. Since the child lived in intimate interaction with the mother or a care-taker, he became so familiar with the other's behavior that he could anticipate it and even reproduce within himself, some of its elements. Further, those people who exercised control over the child were more likely to influence the child to assume their role. The more power they represented, the more influence they had on the child and the more the child would imitate them.

In the midst of diversity of meaning, there was an underlying unity in that

the same learning process is involved regardless of the content of what is learned, the object from whom it is learned, or the stimulus situations in which the relevant behavior is emitted.³⁷

Both imitation and role-playing called for the same learning

35 E.E. Maccoby, "Role-taking in Childhood and Its Consequences for Social Learning", p. 241.

36 Ibid., p. 242.

37 A. Bandura and R.H. Walters, Social Learning and Personality Development, p. 90.

process: through observation of a model, symbolic or real-life, the learner tried to match the behavior of the model. If a distinction were to be made, it should be of the differences in antecedent conditions or the attributes of the model. The latter influenced the imitative behavior of the children in so far as they tended to imitate the successful model even though such aggressive behavior was contrary to their value system. The rewards the successful model received was experienced by the observer vicariously and this positive reinforcement, even only in anticipation, was influential on the performance of imitatively learned responses.³⁸

5. Modeling Influences.

Bandura wrote that certain 'symptomatic behavior' in social learning, which consists of learned reactions, could be "modified directly by the provision of appropriate social models, and by the manipulation of response-reinforcement contingencies."³⁹ Logan et al pointed out that in social interaction among individuals, the manner with which the model performed the reinforcing response had a bearing not only on the probability of a reproduction of that response

³⁸ A. Bandura, D. Ross and S.A. Ross, "Vicarious Reinforcement and Imitative Learning", p. 601-607.

³⁹ A. Bandura, "Punishment Revisited", in Journal of Consulting Psychology, Vol. 26, No. 4, 1962, p. 298.

by the learner, but also on how soon and how strong his reinforcer would be. The model's rewards increased the learner's tendency to perform the behavior demonstrated with reservation for a number of determinants, such as, the "similarity of equivalence perceived by an individual between himself and the observed actor."⁴⁰ Lovaas, in a study on the elicitation of aggressive response by symbolic presentation, found that the tendency to show aggression was due to an increase in the incentive motivation to reproduce the same or similar behavior due to the rewarding, at least punishment-escaping, behavior of the model which helped the viewer to discriminate the more expedient behavior.⁴¹

Walters and Llewellyn-Thomas found supporting evidence for the hypothesis that "subjects exposed to aggressive film-mediated models show an increase in aggressive pain-producing responses."⁴² And in another study, Walters et al reported that observation of the response-consequence of a model led to the inhibition or disinhibition of that behavior on the

⁴⁰ F.A. Logan, D.L. Olmsted, B.S. Burton, R.D. Schwartz, and C.M. Stevens, Behavior Theory and Social Science, New Haven, Yale University Press, 1955, p. 149-150.

⁴¹ O.J. Lovaas, "Effect of Exposure to Symbolic Aggression on Aggressive Behavior", in Child Development, Vol. 32, (no number), 1961, p. 44.

⁴² R.H. Walters and E. Llewellyn-Thomas, "Enhancement of Punitiveness by Visual and Audicicual Displays", in Canadian Journal of Psychology, Vol. 17, No. 2, 1963, p. 254.

part of the observer corresponding to the model receiving punishment or reward. The authors called this type of imitation empathetic learning. The model, usually in real life was the mother, in the experimental setting was an adult actress who might very well represent the mother-image to the children. The general conclusion was confirmation of the hypothesis "that observation of a model-rewarded film facilitated deviation, while observation of a model-punished film inhibited deviant behavior."⁴³

The prestige of the model was found to be another determinant in imitative learning. Through modeling influence, children were induced to change their moral judgment responses from objective to subject, or vice versa, even though such were specific to their age according to developmental laws.⁴⁴ In psychotherapy, when the process of imitation was utilized to bring about behavioral changes,⁴⁵ Bandura noted that it was important for the patient to take on the therapist as a model whose example would then be copied without requiring

⁴³ R.H. Walters, M. Leat and L. Mezei, "Inhibition and Disinhibition of Responses through Empathetic Learning", in Canadian Journal of Psychology, Vol. 17, No. 2, 1963, p. 242.

⁴⁴ A. Bandura and F.J. McDonald, "Influence of Social Reinforcement and the Behavior of Models in Shaping Children's Moral Judgment", in Journal of Abnormal and Social Psychology, Vol. 67, No. 3, 1963, p. 274-281.

⁴⁵ A. Bandura, "Psychotherapy as a Learning Process", in Psychological Bulletin, Vol. 58, No. 2, 1961, p. 143-159.

too much conscious effort. In another study, Bandura and Kupers found that adults were more effective than peers as a modeling stimulus for children who learned to apply self-appraisal^{when} having attained the same level of performance in the task as that of the adult model.⁴⁶

6. The Subject-Variable of Age Differences.

In the review of the literature, Bandura's studies were primarily concerned with children of nursery school age. During these formative years, internalization of value was supposed to take place so that in later years of life, there would not be such a preponderant need for imitative learning as there had already been accomplished a healthy and normal process of socialization. As in other fields of learning, socialization would never come to a perfect fulfillment; rather, there should be a continuity of social learning from childhood to maturity during which imitation was utilized as an economy of social adaptation to a changing environment.

Studies with adult subjects in imitative learning have revealed a highly complex pattern of behavioral responses. Luchins found that with adult subject, there was a greater tendency to rely on one's own judgment: in this experimental

⁴⁶ A. Bandura and C.J. Kupers, "The Transmission of Patterns of Self-reinforcement through Modeling", in Journal of Abnormal and Social Psychology, Vol. 69, No. 1, 1964, p. 1-9.

situation, it was the actual length of the line as perceived, rather than the model's answer which was rewarded though it was false. Observation also showed that some subjects were disturbed or perplexed by the model's erroneous judgment while some even tried to find out the underlying principle for the model's choice. Luchins concluded that "whether or not subjects were influenced by A's (model's) judgment seemed to depend on the obviousness of the correct answer."⁴⁷

Schein was interested in the effect of reward on adult imitative behavior within the framework^e of Miller and Dollard's theory that imitative behavior could be learned through the principles of instrumental conditioning. In this study, imitation was operationally defined "as any agreement between a man's answer and the answer of some man who had responded before him on that item."⁴⁸ Though the results showed that reward administered to imitative responses increased the probability of recurrence of that response, yet due to large individual differences, there were various complex motives for the subject to imitate, which was tantamount to being 'copy-cats', thereby losing independence of judgment

⁴⁷ A.S. Luchins, "On Agreement with Another's judgments", in Journal of Abnormal and Social Psychology, Vol. 39, No. 1, 1944, p. 110.

⁴⁸ E.H. Schein, "The Effect of Reward on Adult Imitative Behavior", in Journal of Abnormal and Social Psychology, Vol. 49, No. 3, 1954, p. 390.

and individuality. There were no conclusive evidence that the subjects grasped the behavior of the model and responded consistently. Under group testing condition, five subjects were tested at the same time, it was not possible to tell whether group conformity exerted greater pressure or individuality brought more prestige, if only self-respect.

Primarily designed to test if reward was the crucial factor in imitative learning of the Miller and Dollard theory, Shwartz's experiment also tested the age factor as the next important independent variable. The only way for the imitator to be correct was to copy the answer given by the model with no other environmental cues that were present for the model only, nor was the model's answer in conflict with anything else in the external situation. The result⁴⁹ showed that rewards were effective in imitative learning only if they were powerful enough to motivate the subjects. Secondly, it was found that older children (age 15-16) imitated less than the younger group (age 9-10) which seemed to suggest that attitude of independence and initiative was already well developed for the older group where copying was incompatible. The subjects' past learning and experience could not be isolated from the experimental treatment. The two alternatives

⁴⁹ N. Shwartz, An experimental Study of Imitation: the Effect of Rewards and Age, unpublished honors thesis, Radcliffe College, Cambridge, Massachusetts, 1953, p. 37-39.

were being independent which was demanded of them by culture and the social milieu, or being right which was possible only by copying. Similar to Luchin and Schein's experiments, the desire to be right (and obtain the approval) and the desire to be righteous (and hold on to one's own judgment) were in conflict. Older subjects tended to rely on their own judgment rather than on the judgment of others.

7. General Statement of the Problem.

In the area of social learning through imitation, the age factor has been studied only to a limited extent. Research reveals that children tend to imitate an adult model more readily than one of their own peers. But the relationship between the age of the learner and the prevalence of imitation has not been studied systematically. However, the literature referred to suggests the possibility that social imitation in children might be a developmental phenomenon, its occurrence varying with the age of the child. Accordingly, the present study is concerned with the problem of whether children at various levels of development differ as to social imitation. The detailed procedures for investigating this question are described in the following chapter.

CHAPTER II

EXPERIMENTAL DESIGN

This chapter begins with a description of the selection of subjects which incorporates the variable of age differences. The experimental task and its administration are then presented. This is followed by an explanation of the scoring system and the statistical technique to be used in the treatment of the data collected. The chapter concludes with the statement of the hypothesis to be tested by the experimental design.

1. Selection of Subjects.

As a developmental study, the present research is concerned with children within the range of six to twelve years of age. To represent this population, three samples are chosen: one at each end of the age-range and one at the middle. These three samples are referred to as the 6-year-olds, the 9-year-olds and the 12-year-olds. Since the experiment will be carried out individually, small samples are more desirable to work with. Hence, each sample consists of thirty girls chosen at random from the Separate Schools of Ottawa, Ontario.

McDavid¹ and Rosenblith², among others, reported complicated findings concerning same-sexed and cross-sexed influence in the model-subject relationship. To simplify the investigation, the present study deals only with the same-sexed influence in imitative behavior.

2. The Experimental Task and Its Procedure.

The task chosen for the experiment was learning to use a pair of chopsticks. It was assumed that its novelty would be of equal motivational force to all the subjects nor would there be a question of bias due to familiarity with the experimental task. For the purpose of practising the use of the chopsticks, miniature marshmallows were provided since their texture was light and flexible and their size was not cumbersome. In the actual experimental task, the subjects were presented with candies differing as to shape and color: the candies being either round or oval, and wrapped in gold or silver foil. These were chosen with the idea that there should be sufficient differences to enter into the notice of the subjects, yet not too much

1 M.W. McDavid, "Imitative Behavior in Preschool Children", in Psychological Monograph, Vol. 73, No. 16, 1959, p. 21.

2 J.F. Rosenblith, "Learning by Imitation in Kindergarten Children", in Child Development, Vol. 30, (no number), 1959, p. 77.

as to cause a preference for one to the other. Degrees of difficulty might influence the children's choice in a problem solving situation, as Child³ observed. The use of color-matching as a possible result of imitation, was based on Rosenblith's experiment.⁴

The experimental procedure was as follows: each subject was tested individually, in a room with the model alone so as to eliminate interference and the influence of a third person's presence. The model asked the subject if she had used chopsticks before. Then, there followed a demonstration by the model of how to use a pair of chipsticks. This constituted the sole instruction and objective of the experiment, as far as the subject was concerned. As the design of the present study was based on Bandura's theory of imitation through observation, unlike Miller and Dollard's imitation through instrumental conditioning, there was no attempt to induce the subjects to pick the same shape or color of candy as that of the model. However, verbal encouragement was given to sustain interest for the completion of the experiment.

3 I.L. Child, "Children's Preference for Goals Easy or Difficult to Attain", in Psychological Monograph, Vol. 60, No. 4, 1946, p. 30-31.

4 Ibid., p. 211-223.

The model and the subject each had a pair of chopsticks and a paper cup as a container for the candies gathered during the experiment. Each subject was given the chance to practise the use of the chopsticks by picking up some miniature-size marshmallows of four colors (fruit flavored) from a box. The size of the box was approximately 9" X 6" X 1½" and the box was usually fairly full of marshmallows.

The model and the subject alternated in the picking of the marshmallows in a series of ten trials with the model preceding the subject's move. While counting aloud the number of each trial, the model picked up a marshmallow and dropped it into her cup. The subject then had her turn to pick up a marshmallow and drop it into her cup. The alternation continued and the series was repeated once for a total of twenty trials. As this was only for the purpose of practice, no particular sequence of color choices was followed. However, in the actual experiment itself, the model followed a pre-arranged pattern of the four choices (A, B, C, D)⁵ with each occurring five times within the twenty trials in a random manner.

5 The four choices were

- A - round in shape, gold in color,
- B - oval in shape, gold in color,
- C - round in shape, silver in color, and
- D - oval in shape, silver in color.

When the practice trials were completed, the model invited the subject^{to} try her chopsticks with the candies. At the beginning of the experiment, the box, approximately 9" X 6" X 1 1/2" in size, contained forty pieces of each kind of candies, making a total of 160 pieces. The candies (mint drops) were not bulky and the box had ample room for the 160 pieces. The subject was then instructed that a similar procedure would be followed in the case of the candies. Emphasis was stressed on letting the model pick up her piece first. In this manner, the model and the subject alternated in picking up the candies, each dropping her candies into her own cup. The model counted aloud though the subject was not asked to count out the number of trials. At the end of the first ten trials, the model invited the subject to repeat the series once more, for a total of twenty trials. Before the second series began, the model stirred the candies around in the box with her chopsticks, in an attempt to bring the subject's attention to the presence of the different kinds of candies in the box. Subjects were never told which piece of candies they should pick even when they asked. They were not informed of the exact purpose and nature of the experiment except to see if they could use a pair of chopsticks.

3. The Method of Scoring.

Since age is the independent variable in this study, the criterion of measurement is not concerned with skill of performance which varies as a function of age. Instead, incidental cues are utilized as they have equivalent values for the 6-, 9-, or 12-year-olds. Scoring was made as to the number of times when the subject's first attempt to pick up a piece of candy matched the shape and/or color of that of the model. Since there were four points of similarity, there would be four categories of scoring:

- a. matching both shape and color,
- b. matching shape only,
- c. matching color only, and
- d. matching neither shape nor color.

This measure of similarity in shape and color would fall in line with the type of incidental learning in Bandura and Huston's experiment.⁶ McGaoch also referred to incidental learning as "learning which apparently takes place without a specific motive or a specific formal instruction and set to learn the activity or material in question."⁷

⁶ A. Bandura and A.C. Huston, "Identification as a Process of Incidental Learning", p. 311-318.

⁷ J.A. McGaoch, The Psychology of Human Learning, New York, David McKay Company, 1952, p. 210.

4. Statistical Treatment and Hypothesis.

In the analysis of data, t-tests were computed between all the possible combinations of the four response categories. Figure 1 illustrates the various points of comparisons. If the similarity as to shape and/or color occurred significantly above chance expectation, it would be interpreted as imitation. Thus, in this chopsticks learning task, imitation is operationally defined as the subject's first attempt to choose to pick up an object of the same shape and/or color as that in the performance of the model.

The main hypothesis of the present study is that there is no significant difference among the three age-groups under study in imitation of incidental behavior. The t-test would be carried out for differences between the various response categories of one age-group to another.

		<u>S H A P E</u>		
		NO	YES	
<u>C O L O R</u>	YES	(3)	(1)	(1) & (3)
	NO	(4)	(2)	(2) & (4)
		(3) & (4)	(1) & (2)	

Figure 1. Categories of Subject-Model Similarity of Responses as to Shape and/or Color.

CHAPTER III

PRESENTATION AND DISCUSSION OF RESULTS

The experiment was carried out in the method described in the previous chapter. However, for the sake of putting some the 6-year-olds at ease, the instruction varied from that of learning to use a pair of chopsticks. Each subject was told she might have some of the candies in the box if she could use a pair of chopsticks to pick them up.

The experimental raw data are presented in Appendix 1. In view of the variable introduced before the commencement of the second half of the experiment, t-tests were computed between the first and the second ten-trials. Since the results (Table I) show no significant differences for any of the response categories, the two halves of the experimental data are treated as one in the statistical analysis.

In order to test the main hypothesis of the subject-variable of age differences, it has first to be established that the similarity in shape and/or color between the model and the subject's responses is an imitative behavior according to the operational definition. This chapter first presents the results of the t-ratios for comparisons between

Table I.

"t"-ratios of Differences in Means between the First
and the Second Half of the Experimental Data
for Three Age-groups of Children.^a

Similarity of Responses	A g e - g r o u p		
	6-yr-old	9-yr-old	12-yr-old
Both Shape and Color	1.33	1.84	1.35
Shape alone	0.67	1.46	0.00
Color alone	0.39	0.94	0.024
None	0.44	1.66	1.11

^a Computed from data in Appendix I.
For each age-group $N = 30$; with $df = 29$, $t = 2.756$
at $P = 0.01$.

the various response categories. Then there are reported some observational findings. Lastly, there is a discussion of the statistical and the observational findings.

1. Tests for Significant Differences.

In order to determine if the similarity in the various response categories within a given age-group occurred significantly above chance expectation, t-tests were carried out. The comparisons made between the various categories as described in Figure 1, are the following:

- a. Both shape and color vs shape alone
- b. Both shape and color vs color alone
- c. Both shape and color vs neither shape nor color
- d. Shape alone vs color alone
- e. Shape alone vs neither shape nor color
- f. Color alone vs neither shape nor color
- g. Total shape vs none of the shape
- h. Total color vs none of the color.

The results of these comparisons are shown in Table II. None of these ratios reaches the 1% level of significance. In view of the operational definition of imitation given in Chapter II, the similarity in the model-subject responses as to shape and/or color, cannot be interpreted as imitation.

Comparisons between age-groups for the test of the main hypothesis is meaningless since the experiment has failed to establish that imitation occurs as a process of observational learning. In comparing the variability between the age-groups, the F-ratios are insignificant (Table III).

Table II.
 "t"-ratios of the Four Response Categories as to Similarity
 in Shape and/or Color for Three Age-groups of Children.^a

Response Categories Compared	A g e - g r o u p		
	6-yr-old	9-yr-old	12-yr-old
Both shape & color vs shape alone	0.93	2.45	0.45
Both shape & color vs color alone	0.14	2.10	1.53
Both shape & color vs none	0.32	1.16	2.18
Shape alone vs color alone	1.12	0.85	1.33
Shape alone vs none	0.63	0.06	1.65
Color alone vs none	0.60	0.91	0.00
Shape vs no shape	0.52	1.52	2.21
Color vs no color	1.23	0.43	0.36

^a Computed from data in Appendix I.
 For each age-group $N = 30$; with $df = 29$, $t = 2.756$
 at $P = 0.01$.

Table III.

"F"-ratios of Responses Categorized as to Similarity in Shape
and/or Color for Three Age-groups of Children.^a

Similarity of Responses	Age-groups Compared		
	6- yr 9-yr	6- yr 12-yr	9- yr 12-yr
Both Shape and Color	1.44	1.25	1.16
Shape alone	1.20	1.17	1.02
Color alone	1.47	1.23	1.19
None	1.02	1.60	1.56
Total Shape	1.06	1.41	1.32
None of the Shape	1.06	1.41	1.32
Total Color	1.45	1.10	1.31
None of the Color	1.45	1.10	1.31

^a Computed from data in Appendix 1.
For each age-group $N = 30$, $df = 29$ in both numerator and
denominator of the F-ratio.
At $P = 0.01$, $F = 2.41$ for $df_1 = 29$ and $df_2 = 30$.

In all likelihood, the three groups were not different in their variability and that they were obtained from the same population. Comparisons of "total shape" and "none of the shape" between age-groups have the same F -ratios since the sum of "total shape" and "none of the shape" is 600 for each age-group. The same applies in the comparisons of "total color" and "none of the color" between the age-groups.

2. Observational Findings.

The novelty of the task succeeded in arousing the interest of the subjects, but inadvertently, it commanded too much of the subjects' attention. They seemed to be too involved in manipulating the chopsticks or too eager to obtain the candies. A few gave the impression that the experiment was a somewhat naive game and hence paid little attention to the performance of the model.

During the course of the experiment, only one subject (9-year-old) asked if she was supposed to pick the same kind of candy (with respect to shape and color) as that of the model. She was told to pick any one she liked since the purpose of the experiment, that of measuring imitative behavior, was not supposed to be revealed to the subject.

One 6-year-old subject picked all twenty pieces of candies in silver wraps. Another 6-year-old verbally expressed her liking for the gold color (subject referred to the gold

color as yellow) though she did not pick at the gold ones only. The rest of the subjects showed no special preference for either of the two shapes and the two color.

Among those who followed the model in counting aloud the number of trials, three were 6-year-old, three were 9-year-old and four were 12-year-old. They were not told to count aloud as the model did, nor were they praised for such a seemingly "imitative behavior".

3. Discussion.

The overall negative findings suggest that in this experimental situation, incidental imitation of the two traits, shape and color, did not occur as a result of observation of a model's performance. The difference in shape (round and oval) and that in color (gold and silver) seem insufficient to require discriminatory judgment on the part of the subjects. Although in the review of the literature, it was seen that incidental learning could occur without the learner's awareness of acquiring that particular bit of behavioral trait, yet the item so learned was somehow related to the solution of the problem. Bandura and Huston¹ described these traits as irrelevant, nevertheless, since the incidental cues were presented during the process of task solution and were of such

¹ A. Bandura and A.C. Huston, "Identification as a Process of Incidental Learning", p. 311-318.

novelty that subjects were apt to notice and were disposed to perform some or all of these incidental cues. Although these were extraneous to the successful solution of the task yet they increased the fun and hence raised the level of performance in the subject's imitative behavior.

In the present experiment, shape and color were not only incidental and irrelevant, but also inconsequential to the process of task solution. Whether the subjects chose to gather a round or oval, gold- or silver-wrapped candy, did not lessen their chance of obtaining the candy. It was noticed that subjects often attempted to pick at those candies which were nearest to the last piece they had gathered. It seems that the two aspects of shape and color do not possess sufficient cue property to elicit a systematic personal preference for one to the other, or a systematic matching in shape and color with those of the model's performance. It was more likely that subjects considered one piece of candy was as good as any other piece.

Since no post-experimental interview was conducted, it could not be determined whether subjects were oblivious to the differences in shape and color or whether they deliberately did not choose to pick the same kind of candy as that of the model. The general impression was that the subjects were pre-occupied with the novelty of chopsticks and gave little or no consideration to the model's choice of candies, nor to their own.

In another way, the negative findings could also be attributed to the short duration of the experiment. In life-situations, the model-subject relationship is strongly established through the process of identification and the affectiveness of the model. While it seems to require no time for the child to learn to imitate the parent, it is not clear whether a child would or would not imitate a complete stranger. Further research on incidental imitation, therefore, might rely on more distinctive cues or provide a greater variety of incidental cues in the experimental setting. It might also require a longer session or a number of sessions to establish a model-subject relationship to facilitate imitative learning.

Since the experiment failed to establish that imitation occurred, there is no conclusive evidence to indicate whether or not age is an important factor in following incidental cues. Based on Bandura's theory that imitation is observational learning, the hypothesis remains as to whether older children imitate more since they have keener observational power. It requires further research to determine the influence of age differences among subjects in imitative behavior.

SUMMARY AND CONCLUSIONS

Bandura's theory of imitation which is observational learning, has stirred up interest to investigate the subject-variable of age differences. In the review of the literature, it was seen that experiments with pre-school children have demonstrated that they are susceptible to modeling influence. However, it is not clear that older children, as a rule, are also susceptible to modeling influence. It has been speculated that since imitation is incompatible with the attitude of independence, older children would not imitate as readily as younger children. On the other hand, it could be assumed that if imitation is observational learning, older children should be able to imitate more as their observational power is keener than that of younger children.

In testing age differences among three groups of children of ages six, nine and twelve, the criterion of imitation was one of incidental cues: two shapes (round and oval) and two colors (gold and silver). Incidental cues are utilized since the success of subject's performance was not dependent upon them. The incidental cues were presented in the forms of candies and ostensibly, the subjects were required to learn to use chopsticks to pick up these candies. The model and the subject alternated in their total of twenty trials in picking up the candies. Subjects were not informed that they were

being tested for their imitative behavior in following the model's choice of shape and color.

The experimental results were mainly negative indicating that the subjects' choice of candies bearing the same shape and/or color to that of the model, might well have happened within chance expectation. In light of the operational definition, these similarities could not be interpreted as imitation. From observation of subjects' reaction to the experiment, it was surmised that possibly the subjects were not responding to the two cues of shape and color, as they seemed to be too absorbed in the novelty of the task. It was also possible that the total of twenty trials in the actual experiment, though preceded by 20 practice trials, was too short to establish a model-subject relationship.

Since the experiment failed to establish imitation, comparisons between age-groups for significant differences became meaningless. The hypothesis which this study set up to test still remains. There is no conclusive evidence as to whether age is an important factor in imitative learning. It is not clear to what extent the assumption that with more observational power, older children should imitate more, can be held true. On the other hand, it is also uncertain whether imitation and the attitude of independence are incompatible, and if so, to what extent such generalization is applicable. Research has yet to investigate this type of observational

learning to determine whether Bandura's theory adequately explains imitation as observational learning or whether the theory has to be qualified in its application for various age-groups.

BIBLIOGRAPHY

Bandura, Albert, "Social Learning Through Imitation", in Nebraska Symposium on Motivation, M.R. Jones (Ed.), Lincoln, University of Nebraska Press, 1962, p. 211-269.

The author gives a theoretical exposition of the processes of imitative learning. In a compact statement, the theory claims that contiguous sensory stimulation is a sufficient condition for the acquisition of most forms of matching responses. There are other variables which facilitate or impede imitative learning.

The present study is based on the contiguity-sensory theory of imitation. Upon presentation of stimuli, subjects should acquire appropriate perceptual and symbolic responses which could be translated into the corresponding overt responses immediately or at a later time. These stimuli could be essential for the solution of a problem or irrelevant.

Bandura, Albert, and Richard H. Walters, Adolescent Aggression, New York, Ronald Press, 1959, xii-475 p.

Through identification and imitation, children learn to internalize the value system exemplified by their parents. It emphasizes the importance of social influence and the efficacy of social models in bringing about behavioral changes.

Since adolescent misdemeanor has its stem in internalization of values during early childhood, it is important to investigate at which developmental stage the child begins to make use of the processes of identification and imitation. It is of equal importance to investigate whether the child dispenses with these processes or whether he continues to utilize them though in a modified measure. The present study attempts to investigate the process of imitation during the period of childhood from six to twelve years.

Bandura, Alber, and Richard H. Walters, Social Learning and Personality Development, New York, Holt, Rinehart and Winston, 1963, xi-329 p.

The authors conducted a socio-behavioristic study of the theories of imitative learning, particularly of child behavior generalized to later life. Although imitation is not an instinctive habits, yet it is so easily cultivated that, in fact, it is widely used during the process of socialization.

The extent of the modeling influence could reach as far as the learning of incidental cues. There is support for the present study in that it seems no conscious effort is required in learning an incidental behavior once the model-subject relationship is established.

APPENDIX 1

In recording subjects' performance, frequencies are reported as to similarity in shand and/or color between subjects and model's choice of candies. There are four categories of responses:

- a. similarity in both shape and color,
- b. similarity in shape alone,
- c. similarity in color alone, and
- d. no similarity.

Since the twenty trials are performed in two series, two sets of scores are given. The first ten-trials and the second ten-trials are spread out among the four response categories. In the following tables, one for each age-group, each subject has eight scores: one for each of the first and second ten-trials of the four response categories.

Table IV.

Frequencies of Similarity between Subject and Model's Responses as to Shape and Color of Thirty 6-yr-old Children.

Both Shape and Color		Shape alone		Color alone		None	
Test 1st	Half 2nd	Test 1st	Half 2nd	Test 1st	Half 2nd	Test 1st	Half 2nd
1	0	2	1	4	5	3	4
4	2	0	5	1	2	5	1
1	0	5	1	2	5	2	4
2	4	2	3	2	2	4	1
1	4	5	1	2	2	1	3
2	5	4	1	3	1	3	1
4	4	1	1	4	2	1	3
4	2	2	1	2	3	3	4
3	3	3	1	6	3	1	3
0	2	2	0	0	2	6	2
2	2	2	3	3	3	2	2
4	1	1	1	3	4	2	4
1	2	2	4	4	3	3	1
1	2	2	3	4	2	3	3
4	6	4	2	2	2	0	0
3	4	3	2	0	2	4	2
2	3	4	1	4	1	0	5
4	3	3	3	1	0	2	2
2	6	2	3	4	1	2	0
4	4	0	1	1	2	1	3
4	3	0	2	2	3	4	3
2	1	2	2	3	3	2	4
3	3	1	2	2	4	3	1
3	2	4	4	1	3	2	1
3	3	1	2	4	3	4	1
1	3	3	3	4	3	4	2
0	3	3	3	4	0	3	4
1	1	4	6	2	2	3	1
1	2	2	3	5	4	2	1

M:	2.30	2.87	2.43	2.17	2.70	2.57	2.57	2.40
M ₂₊₂ :	5.17		4.60		5.27		4.97	

Table V.

Frequencies of Similarity between Subject and Model's Responses as to Shape and Color of Thirty 9-yr-old Children.

Both Shape and Color		Shape alone		Color alone		None	
Test 1st	Half 2nd	Test 1st	Half 2nd	Test 1st	Half 2nd	Test 1st	Half 2nd
4	2	1	3	2	3	3	2
4	2	1	2	3	1	2	3
1	5	5	3	1	0	3	2
2	2	3	2	1	1	3	2
5	2	3	3	1	1	4	5
4	4	3	3	0	1	3	4
4	1	2	4	1	1	3	4
4	3	2	1	0	3	4	3
2	4	1	1	4	1	3	4
2	2	1	3	4	3	3	2
4	2	2	3	4	3	0	2
4	2	1	3	2	1	3	2
2	2	1	3	4	1	3	4
5	3	3	4	2	1	0	2
1	4	3	0	4	5	2	1
1	3	3	4	2	1	2	2
3	2	1	3	3	1	3	4
3	2	2	3	5	3	0	2
5	3	3	2	0	1	1	3
2	4	1	3	2	0	1	3
2	2	4	3	4	1	3	2
4	2	3	1	1	3	3	2
5	1	2	4	2	2	1	3
5	3	2	2	2	5	1	0
2	2	4	3	2	1	2	4
1	3	2	4	2	2	4	1
7	3	1	3	0	1	2	3
1	2	2	1	5	5	2	2
3	0	1	1	4	4	2	3

M:	3.27	2.57	2.23	2.67	2.30	2.03	2.20	2.73
M ₁₊₂ :	5.84		4.90		4.33		4.93	

Table VI.

Frequencies of Similarity between Subject and Model's Responses as to Shape and Color of Thirty 12-yr-old Children.

Both Shape and Color		Shape alone		Color alone		None	
Test 1st	Test 2nd	Test 1st	Test 2nd	Test 1st	Test 2nd	Test 1st	Test 2nd
5	6	2	2	1	2	2	0
5	3	3	3	1	0	1	4
4	2	3	2	1	3	2	3
3	2	1	2	2	3	4	3
2	3	2	3	4	2	2	2
3	3	3	3	1	0	3	4
3	1	1	3	2	4	4	2
2	1	4	3	2	3	2	3
0	2	2	2	6	5	2	1
4	4	3	2	1	4	2	0
4	4	4	2	1	1	1	3
2	5	3	2	4	1	1	2
2	3	3	1	3	4	2	2
4	2	0	3	1	3	5	2
4	1	1	0	4	4	1	3
3	3	2	2	2	2	3	3
2	2	2	3	2	3	4	2
1	3	4	3	4	3	1	1
2	2	2	3	1	1	5	1
0	5	6	1	3	1	1	3
4	4	3	1	1	3	2	2
1	4	4	5	1	1	4	0
3	6	4	1	3	1	2	2
3	3	3	5	1	1	3	1
2	3	4	3	1	3	3	1
2	4	4	2	3	1	1	3
2	1	1	5	4	3	3	1
0	3	3	3	5	2	2	2
2	1	3	5	4	2	1	2
3	5	2	2	0	1	5	2
M:	2.57 3.03	2.67 2.67	2.30 2.23	2.47 2.07			
M ₁₊₂ :	5.60	5.34	4.53	4.54			

APPENDIX 2

ABSTRACT OF

Incidental Imitation in Social Learning¹

In an attempt to investigate Bandura's theory of imitation, an experiment of chopsticks learning was designed to test the hypothesis of whether age is a crucial factor in imitative learning. Aiming at a representative sample of the elementary school population, three age-groups were chosen for the present study: 6-year-olds, 9-year-olds and 12-year-olds. It has been demonstrated that the powerful mechanism of imitation is not restricted to the learning of the essential but also the incidental aspects of behavioral responses. The measure of imitative behavior, therefore, is based on the observation and the reproduction of incidental aspects in this learning situation.

Of the two traits, shape and color, chosen as an index of imitation, the experiment failed to establish that imitation occurred. The general impression was that subjects were pre-occupied with the task solution and gave little or no consideration to the choice of candy the model had picked and the choice they had in matching or not matching in shape and

¹ Paula J. Yanne, master thesis presented to the Faculty of Psychology and Education of the University of Ottawa, Ontario, May 1966, ix-50 p.

color. The statistical analysis yields insignificant t-ratios for any comparison between the various response categories within the age-group. These similarities, therefore, cannot be interpreted as imitation in the light of the operational definition. Hence, comparisons between age-groups for the test of the main hypothesis of age differences has become meaningless. There is no conclusive evidence that age is or is not a crucial factor in imitative learning.