THE DYNAMICS OF DECISION IN CHILDREN OF TWO AGES

by

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CHAPTER I

INTRODUCTION

Considerable work has been done on conflict and the general outlines of conflict theory are quite well agreed on. Lewin has presented a conceptual picture of conflict which is rich in psychological meaning and has supported it with empirical examples from child and adult behavior. Miller (21) and others of the Hullian group have outlined a theory of conflict based on reinforcement theory and have tested their hypotheses with a large number of animal studies and a few studies on human adults. But the emphasis both by Miller and others of the stimulus-response group and by Lewin and his followers has been on the development of a general theory of conflict with little regard for possible ways in which developmental factors might influence conflict behavior.

Anyone who has ever watched a small child before a candy counter or who remembers his own quandary when he tried, as a small child, to determine the one best way to spend a dime must realize that making a choice is not a simple thing for a child. When confronted with a relatively unimportant choice between one desirable thing and another, the normal well-adjusted adult can usually arrive at a decision with a minimum of conflict, but it is sometimes a very difficult problem for the child.

Part of the child's difficulty in making choices stems from what Lewin describes as a limited time perspective (20). The adult does much of his actual living in a fairly tangible future and can better accept the possibility of giving up something desired now because he

believes he may be able to have it later. But for the small child the future holds little concrete meaning and he must act, almost literally, as if every moment is the only moment. In addition, it is very difficult for him to assume an "as if" attitude; either a thing exists or it does not.

Another factor which facilitates decision-making for the adult is what Murphy (22) calls "canalization." For the very young child the world is probably perceived largely in terms of the familiar and the strange. As the child grows older the familiar may become divided into the liked and the disliked, but within these affective classifications there is still a great lack of differentiation, so that many things may be about equally attractive to the small child. It is a hard task for him to choose between two things he likes because he has not yet developed the specialized preferences he will have as an adult. The adult has long since decided that he likes chocolate ice cream better than vanilla, dramatic movies better than comedies, blue suits better than brown.

It is not just that the adult has acquired many isolated preferences for certain things rather than others, but that he has developed a picture of himself as a certain kind of person. Consequently, when confronted with a choice situation that he has never had to cope with before, he still has his self-image as a point of reference and can make decisions on the basis of their consistency with his picture of himself. The young child, on the other hand, has no definite opinion concerning the choices appropriate for boys and girls respectively,

much less has it identified itself with one of the two groups. He may see no inconsistency in choosing a frilly doll and a pair of boxing gloves at the same time. According to Baldwin (1) and others the actions of the young child are very much determined by the "pull" the immediate situation exerts on him. It would be inaccurate to maintain that emotional factors or the structure of the immediate situation never affect adult decision-making, but it is certainly true that adults generally operate on a higher conceptual level than the young child.

Such factors strongly suggest that there is need for research on conflict derived from developmental theory rather than from learning theory. Baldwin (1) points out that experiments analogous to those reported by Miller on approach and avoidance gradients have not been performed on young children, older children, or adults, but he hypothesized that the psychological situation and way of handling the conflict may be quite different for adults and children because of the adults' greater psychological maturity.

The young child's world is so structured that he has only a small amount of control over himself and his environment. His limited psychological maturity makes it difficult for him to foresee conflict situations, and his meager experience provides him with few ways of avoiding them. Accordingly, he probably finds himself in even more conflict situations than the adult. From a clinical as well as a theoretical point of view, then, the study of children's choice-making behavior with its concomitant conflict should be valuable.

CHAPTER II

REVIEW OF RELATED LITERATURE

A. Historical Background

Reaction time experiments were concerned with choice as early as 1868 when Donders, a Dutch physiologist, included the processes of "choice and discrimination" in reaction time experiments. In these experiments the subject was required to react with the hand on the same side as the stimulus. Donders defined "discrimination" in this situation as determining the location of the stimulus and "choice" as deciding which hand to use in making the response. His work preceded much research on the reaction time of choice both in Wundt's laboratory and in America. A number of studies (14, 26) have been done on the reaction times of children and there is general agreement that reaction time decreases with age. Also there appears to be a fairly consistent sex difference with boys reacting somewhat faster than girls.

Other early studies on choice-making are reviewed by Wells (30) as a part of her doctor's dissertation on the act of choice completed at Cambridge in 1927. One of the earliest experiments was by Michotte and Prum in 1910, in which they studied free choice by means of introspection. An early study foreshadowing Lewin's later work on valence, titled "Motive-force and Motivation Tracks," was completed in 1911 by Boyd Barrett under the direction of Michotte. He used liquids of varying

degrees of pleasantness and unpleasantness, presenting them in paired comparisons. From the data on one subject he concluded that speed of choice and "hedonic value" of the chosen object are correlated.

Wells also used liquids of differing degrees of pleasantness and unpleasantness and arranged them in a paired comparisons design. She found that a choice does not always depend on what Barrett termed hedonic value. From the introspections of her subjects she learned that they sometimes chose the more unpleasant of two liquids because it seemed the more "ethical" thing to do, because of capriciousness or a desire for change, or because of extraneous circumstances. In addition she found that it required more conative effort and took a longer time to make a choice between liquids of about equal value in terms of pleasantness or unpleasantness than it did when the liquids were dissimilar in value. Order of presentation made no difference in the choice, but the original evaluations or rankings of the liquids agreed very closely with choices in the part of the experiment where paired comparisons were made.

B. Modern Conflict Theory

As with so many other problems in psychology, the thinking of Hull and Lewin has stimulated much experimental work on conflict. While they have different theoretical explanations, their followers are quite well agreed on what happens in the basic conflict situations when the subject has to decide (1) between two things or courses of action he wants (approach-approach), (2) two he does not want (avoidance-avoidance), or (3) one which has both positive and negative aspects at the same time (approach-avoidance).

Miller (21) agrees with Lewin that an unstable equilibrium is created in the first case. Since the subject would be pleased to have either of the two alternatives, it is clearly more desirable, other things being equal, to be actually moving toward a goal than to be standing in empty-handed indecision. So the balance is quickly tipped toward one or the other goal, and once on the way toward the chosen goal, that goal theoretically becomes increasingly attractive, while interest in the rejected goal as steadily diminishes.

In the other two situations the conflict situation creates a stable equilibrium. A subject faced with a choice between two things he does not want is trapped (assuming that adequate barriers have been erected to keep him in the field); no matter which way he goes, he is forced to move toward something undesirable. Consequently, the closer he comes to object A, the more undesirable it will seem and object B, in contrast, will seem less distasteful, since it is now further away. So the subject

may waver for some time between the two goals before he can decide which is the lesser of the two evils and bring himself to leave the region of indecision.

In the third case the subject both desires the object and fears or dislikes some aspect of it, as in Lewin's example of the bashful boy who wanted to ask a girl for a date but feared refusal. A person in this situation can move toward the goal until the fear or dislike becomes too strong for him; then he must retreat. As he withdraws the force of the negative aspects of the situation become less potent, the positive aspects become attractive, and he once again moves in the direction of the goal, until the negative forces again become too strong for him and the cycle is repeated. Miller points out that this state of affairs will continue until some disturbing force, sometimes the desire for a decision, upsets the equilibrium.

Miller (21) believes it is inaccurate to speak of conflict in a pure approach-approach situation. He proposes that any approach-approach situation, where the choice is between two equally desired objects and which produces conflict, actually has hidden avoidance tendencies in it causing the conflict. In support of his argument he cites experiments using human adults by Hovland and Sears, animal studies by Hunt and Klebanoff, and a study using children by Godbeer. Results of these studies suggest that an approach-approach situation elicits much less conflict behavior than the other types of conflict situation.

The choice objects in an approach-approach situation, according to Lewin, must have relatively high valences; otherwise the subject will

leave the field before he has reached a decision. If the choice is between two negative goals some kind of barriers will be necessary to confine the subject to the field until he has made a choice.

As Lewin defines it, the act of deciding, or resolving a conflict situation, is "essentially a restructuring of the field. Before the decision is reached an overlapping situation exists for the person. The forces resulting from the two overlapping situations are opposed to each other. The decision means that one of the overlapping situations becomes predominant" (17, p. 160). The type and strength of the overlapping field forces, according to Lewin, determine the speed of the decision.

Another factor affecting the time it takes to make a decision is the positive or negative valence of the act of deciding itself. At times, Lewin says, it may be advantageous to stay in the realm of indecision, particularly when neither of the choices is very attractive. However, in choosing between two positive things, a person reaches "a point of unavoidable decision" where he can no longer proceed without choosing one or the other alternative. The decision may come before the person reaches this point depending "to a high degree upon the positive or negative valence which the act of decision itself has under the given circumstances." (17, p. 200)

Festinger and Cartwright (5) have extended the work of Lewin on conflict in a highly sophisticated theory of decision, in which they have attempted to combine topology and the calculus of probability.

Although they utilized psychophysical data, they assumed that the theory would be valid for any decision situation. They discuss the problem of overlapping situations to which Lewin assigns such a prominent role, as follows: "The strength of each of the forces acting on the person will depend upon how much weight or potency each situation has for the subject. . . The potency of each overlapping situation is determined by the subject's feeling of probability that his judgment is correct" (5, p. 597).

C. Developmental Theory and Conflict in Children

A number of psychologists have pointed out some of the major psychological differences between young children, older children, and adults. Lewin stresses increasing differentiation of the life space as a significant characteristic of development, listing as the main differences in the developmental stages "(1) an increase in the scope of the life space in regard to a) what is a part of the psychological present; b) the time perspective in the direction of the psychological past and the psychological future; c) the reality-irreality dimension; (2) an increasing differentiation of every level of the life space into a multitude of social relations and areas of activities; (3) an increasing organization; (4) a change in the general fluidity or rigidity of the life space" (19, p. 797).

Baldwin (1) parallels some of these changes in his maturity continuum and indicates others. He includes seven characteristics of increasing maturity: (1) expansion of the psychological world spatially, temporally, and logically; (2) the attainment of environmental constancy, including constancy of objects, people and personality, and size; (3) value constancy; (4) the achievement of independence from field structure; (5) differentiation; (6) loss of egocentrism; and (7) resistance to regressive effects of stimulation and stress.

The child's world as seen by Werner is a world of action, "a behavioral sphere in which everything is framed in terms of handiness and unhandiness, of efficaciousness and inefficaciousness." He continues to describe it as "ego-centered and concrete; it is a world of

nearness at hand. The younger the child the 'nearer' it is, and the distance separating subject and object increases with age" (31, p. 383). A major characteristic of the child's cognitive structure and his view of the world is the lack of differentiation which Lewin also stresses. Piaget's three-step developmental theory (24) starting with sensori-motor concepts of the world, ranging through egocentrism and reaching maturity in a logical view of the world, agrees quite well with this picture.

There is considerable overlap among leading developmental theorists in the way in which they conceptualize the increasing psychological maturity of the child. They generally agree that the world of the young child is a here-and-now world where perception, emotion, action, and general cognitive activities tend to blend into one another or, to be more accurate, these processes have not yet separated from each other. As the child grows older differentiation between and within these factors occurs, so that he has an extended range of emotions instead of the earlier rather diffuse reactions; his perception of things is less likely to be affectively tinged and is well-articulated instead of global; he has a past and a future which are significant influences in his present; he is able to withhold action until he has sized up a situation cognitively rather than being forced into action by the pull of the immediate situation.

Relating increasing maturity to the handling of conflicts Lewin makes the following statement:

> Within the young child the opposition of two approximately equal field forces in the conflict situation leads typically (so far as it is not an unstable equilibrium) to a relatively rapid alternation of action in the direction, in turn, of each of the two field forces. It is a characteristic indication of greater self-control when, instead of this oscillation of action, the child displays a relatively calm type of behavior while the conflict remains unsolved. (17, p. 112)

Lewin's analysis of the child's action in the detour problem has some valuable suggestions for choice behavior, especially when he considers the effects of an object with a very strong positive valence. "That relative detachment and inward 'retirement' from the valence which is so favorable to perception of the whole situation and hence to the transformation of the total field, which occurs in the act of insight, is made much more difficult" (17, p. 105). Although the reference is to detour behavior, it is probable that the same effect would occur when a child is expected to choose between two highly desired objects. Lewin points out that among older children it is often necessary for them to make a psychological separation between themselves and the valence of the object to be obtained.

Lewin stresses the role of momentary needs of the young child in determining the kind and strength of valence of a given object. Although the valence of objects also changes for adults as their needs change, as with food, they are much less influenced by momentary fluctuations of needs than young children. A second effect of increasing age on valence, according to Lewin, is the shift in objects which carry valence as the child grows older.

In the development of choice behavior Werner makes the following statement:

> On the primitive level, choice is guided by the signal-values of the concrete situation. This is concrete in terms of affective needs. The preference is governed by the relatively higher affective valence of some one of the objects. A genuine act of choice appears much later. This subsequent act is not entirely concrete; it will be consummated not in a visible field of objects having diverse signal-values, but in the person. It is a choice among motives. It is a fundamental step in the development of character in the normal child from four to six years of age that a choice of motive should supplant choice based on the demand-character of the affective situation. (31, p. 195)

Baldwin (1) is in general accord with the ideas of Lewin and Werner on the young child in a conflict situation. In his discussion of the approach-avoidance conflict situation he suggests that under the stress of conflicting desires an adult human being might behave quite differently than a child or a rat, who tend to vacillate around a point where the strengths of the positive and negative valences are approximately equal. Baldwin maintains that the adult would either decide to take the punishment to get to the goal or give up the goal. He believes this is the case because the adult has attained what he calls value constancy and therefore does not have a greater fear of the punishment when he is close to it than when he is far away from it. The adult, unlike the small child, is theoretically unaffected by the distance in time or space from the goal or the punishment, and can make his decisions on a more rational basis.

D. Experimental Work with Children

While there have been few experimental studies directly concerned with the effects of increasing psychological maturity on choice-making behavior, both the Lewinian and the Hullian theories have served to stimulate work using children as subjects in these experiments. The followers of Lewin, in particular, have used choice-making as an experimental technique in studying other problems. Many of the experiments to be cited below are relevant to the present study in demonstrating the use of choice-making procedures with children, although the problems investigated are not directly related to this experiment.

Barker (2) published a study in 1942 designed to study the effect of different valences on choice-making. His nineteen subjects, nine-to-eleven-year-old boys, were each presented with a sequence of pairs of liquids and were told to choose the one they preferred. Seven liquids were used, ranging from very pleasant pineapple and orange juice to highly unpleasant vinegar and a saturated salt solution. The liquids were presented under three conditions: (1) from pairs of desirable liquids to pairs of undesirable liquids; (2) from pairs of liquids of similar desirability to pairs differing greatly in desirability; and (3) where the conflicts were made real by having the subject drink the liquid of his choice, and where the conflict was rendered hypothetical by having the subject merely say which he would drink. One measure of conflict used was the number of times the child wavered from one liquid to the other before making a final choice, i.e., VTE's. The other measure was response time.

Barker found that it took longer to resolve the conflict when the alternatives were close together on the preference scale. The result was the same whether the children had to drink the liquids they chose, or knew they need not. There was a general tendency for time and VTE's to increase when negative alternatives were involved, but the smallest time and VTE's did not occur with neutral alternatives as might be expected. While the differences were not statistically significant, there were also trends toward the following results: (1) more VTE behavior occurred during the solution of conflicts between negative alternatives than between positive alternatives; (2) conflicts between positive alternatives resulted in longer times and more VTE behavior than conflicts between neutral alternatives; (3) Choices known to involve experience required more time and more VTE behavior than choices known to be hypothetical.

The work of H. Wright (35), while not directly concerned with choice-making as a problem, used it as a technique in studying the effect of barriers on valence. He believed that a goal with a barrier before it has a stronger positive valence than a goal which is easy to reach. He used two situations, choice-in-action and verbal statements of choice, with both children and adults serving as subjects. The children ranged from four to eleven years old, but because he was interested in general laws, he did not make a developmental analysis of his data.

In comparison with the experiments using adults, the children were less inclined to prefer goals where barriers had to be overcome. However,

the experimental situations for the children were more artificial than those used with the adults, and Wright believes this may have been a causal factor. The adults, who were waitresses at the university student union, were not subjected to a formal experimental procedure. They were merely observed as they took desserts from the serving counter to determine whether they chose desserts which were closer to them or further away. The observations were repeated when they chose desserts for themselves. Wright describes the situation of the adult subjects as "a minor incident in a three-times a day routine." (35, p. 391) But for the children the experiment had the qualities of a highly exciting adventure in which they did novel things and received toys and candy.

Wright hypothesized that what he called a "generalized-goal tension" in the younger children was another factor in their tendency not to prefer the more distant goal, in contrast to the adult subjects. The children learned from other children participating in the experiment before them what they could expect to receive. Wright states:

> The main idea was to get a thing of the sort which the other had displayed. Often it looked as if out of interest in the generalized goal the child could not be bothered with choosing between particulars, least of all with choosing the thing that was hard to get (35, p. 391).

Child and Adelsheim (7) repeated some of Wright's experiments, applying more rigid controls in variations, but still studying the effect of barriers on choice-making behavior. They used nursery school children from two to eight years old with the majority of them between three and five and found that the nursery school children rarely chose the more distant of the two objects from which they could choose.

In a later more extensive study (6), Child tested the effects of previous learning on children's preferences for goals which were easy or difficult to obtain. He studied the effects of age variation, sex differences, sex of the experimenter, the nature of the barrier, and the instructions. In his study the children ranged from the first to the seventh grade. Soft cream chocolates were used as goals and in one situation the children had to go around a table to get the more distant candy; in the other they had to climb a short ladder. One set of instructions stressed that one goal was easy to obtain, the other hard, while the other set of instructions made no mention of this. Both male and female experimenters were used.

In general the results supported his hypothesis that past experience is an important determining factor in preference for a more difficult goal. Boys, because of cultural emphasis, Child feels, were more likely to take the far goal. Subjects working with the woman experimenter tended to take the far goal more often. However, the type of instructions used made no difference and the type of barrier did not have a different effect. The children were asked to give reasons for their choices and the older children's answers revealed ability to generalize on a higher level about their choices than the younger children.

Irwin, Simon, and Armitt (12) did another study testing Wright's hypothesis on the effect of temporal proximity on the choice of objects. They used children from four to nine years old, giving them a choice between two objects, one which they could have immediately, and another for which they would have to wait anywhere from three minutes to a week.

The toys used in the study were varied according to age and sex of the subjects and all subjects sooner or later received both toys of the choice pair. He found that a majority of the children in all the conditions chose the immediate object, failing to support Wright's contention that barriers enhance valence. However, the implications of these findings for Wright's hypothesis may not be too great, since the barriers are so different.

In another series of experiments Irwin and Gebhard (13) studied the effects of ownership and other social influences on object preferences in children from six to nineteen years old. Most of the subjects preferred the objects which they were told would be theirs. They also tended to attribute their own preferences to their friends. However, they liked objects better which were to go to a stranger than to a friend. The experimenter's expressed preference for one object rather than another had some influence on the children's preferences, but not an overwhelming amount.

B. Wright (34) studied altruism in children, using third graders between eight and nine and half years old. The children ranked sixteen toys into four degrees of preference in a preliminary session. The next day half of the children were told to pick the toy they would give to a friend and half were told to pick the toy they would give to a stranger. The toys used were one which they had placed high in their ranking and one which they had placed low. More than twice as many children were generous with a stranger as were generous with friends.

The experiment was repeated after two months. The children who had originally served in the group which was given the opportunity to

be generous with a friend, now served in the group which could give the best toy to a stranger if they chose. The children who had first been in the group sharing with a stranger, now were asked to make choices for a friend. She found that the children who were most generous in the first situation, regardless of the group they were in, were also most generous the second time.

In a second set of experiments the children were told they could give one toy to a friend and one to a stranger. One of the toys, they were told, was "real good" and the other not so good. A majority of the children here also favored the stranger. A third variation checked the relationship between a child's own generosity and his perception of class generosity. The more generous children perceived others as more generous.

A large number of studies have been done on toy preferences, but they are not relevant to the present study, since the methods and emphasis were on determining the kinds of toys preferred by children rather than on the dynamics of choice behavior. Of this group, however, the toy preference study of Vance and McCall (28) has some relevance to this problem.

Pre-school children ranging from three and a half to six and a half years old with I.Q.'s from 96 to 150 were used in the Vance-McCall study. They were interested in comparing the preferences of a group of pre-school children for a series of pictures of play materials and for the actual play materials, as used in spontaneous play. The pictures were shown in a series of paired comparisons and a retest was run within a week to three weeks after the first test.

They found a test-retest reliability on the pictures choices of .78 for the four-year-olds, .68 for the five-year-olds, and .95 for the six-year-olds. However, the groups were small and the results of the five-year-old group were not considered valid by the experimenters, so these correlations at best indicate a trend. On the later comparison with actual behavior the correlations between preferences on the pictures and time spent with each toy and order of choosing were not significant.

Godbeer (10), a student of Miller's, did an experiment in 1940, using first and second grade boys, in which she attempted to discover some of the variables causing conflict in what appear to be approach-approach situations. Her study was not primarily a study of child behavior in conflict since she expected her results to be applicable to adults as well and used children only because she believed it would be difficult to get a highly motivating situation for adults. She investigated four types of what she termed only superficially approach-approach situations. The first was the effect of having to give up one goal in order to have the other. The second was the effect of having qualitatively dissimilar goals. The effect of having quantitatively dissimilar goals was the third, and the fourth was the effect of being uncertain about getting a reward as a result of choosing. Her materials were large gumdrops and toy soldiers which she presented behind a screen. After a series of training trials the boys were given a non-choice trial with just one gumdrop presented; a non-relinquish trial where they could have both candies, but had to decide which to take first; and a relinquish trial where they had to choose one of two gumdrops. On the test of

qualitative differences she had the children equate the number of toy soldiers they would give for a gumdrop. They then chose either the gumdrop or the equivalent number of toy soldiers.

As expected, she found a significant difference between relinquish and non-relinquish trials, but not between non-choice and non-relinquish trials. She also found that qualitative differences in the choice objects made the decision more difficult. More conflict occurred when objects in the choice situation were judged equal by the subject than when they were not. In the uncertainty situation, where the subjects actually received rewards whenever they chose, although they did not know for sure that they would, there was again a significant difference between the relinquish and non-relinquish situations, but there was also some conflict when this was not a factor.

Although he did not use children as subjects, Barker (2) conducted an experiment which bears on the problem of the relationship between certainty of choice and the valence of the alternatives. He used paired alternatives between personality characteristics and environmental conditions. The subjects were asked to make their choices and were asked to indicate the degree of certainty they felt in their choices. This indication of subjective uncertainty was used as the measure of conflict.

He found that the frequency of uncertain choices increases as the differences in valences of the alternatives decreases. A second finding was that frequency of uncertain choices increases when the magnitudes of the valences of the alternatives increases although differences in

valence remain constant. In addition, he found that the frequency of uncertain choices was greater for negative than for positive alternatives.

A review of the literature has shown that there is no dearth of theory either in the area of conflict or in the developmental area. Experimental work on conflict has been largely devoted to theory testing, but Lewin, Werner, and Baldwin have attempted to discuss conflict as it appears in a process of increasing psychological maturity. Leaning heavily on the concept of lack of differentiation which they believe to be characteristic of the world of the young child, they have tried to suggest how this might affect a young child's behavior in a conflict situation.

CHAPTER III

STATEMENT OF PROBLEM

The present experiment is designed to study the effects of increasing psychological maturity on the behavior of children in a choice-making situation. It is proposed that young children will differ from older children along the lines suggested by Lewin, Werner, and Baldwin and that the characteristics associated with psychological immaturity must be taken into account when attempting to apply the principles of modern conflict theory to the choice-making behavior of young children.

A number of points in the discussions concerning psychological immaturity suggest that the young child will be less stable in his choices than the older child. As Werner portrays him, his choices are governed by his affective needs, and the needs of the young child, according to Lewin, shift rather rapidly, causing alterations in the attractiveness of the objects in his environment. Therefore, in expressing preference for one toy or another, the young child may change his choice within a comparatively short time without realizing the inconsistency of his actions.

The older child, on the other hand, should be more consistent in his choices, since his world is becoming a more differentiated, stable one, where he is no longer so much at the mercy of his immediate needs and the immediate environmental forces. To express a preference for one toy at one moment and for another a few moments later should, in addition disturb his feelings of consistency, since with his increasing time

perspective, he should be more consciously aware of his past actions and their implications for his present behavior. There would probably be an even greater disparity between the consistency of choice behavior in older and younger children if the time interval between first and second choices were increased beyond the limits of an immediate situation to a week or more.

Since they have not yet become differentiated as to the age and sex roles society expects them to play, the young children will probably differ widely among themselves in their toy preferences. Boys and girls, for example, can still play with each other's toys without much ridicule from onlookers. An older boy, however, must carefully conceal any interest he may feel in dolls and the older girl will be criticized if she is too active in boys' games. Therefore, the older child's preferences are somewhat imposed upon him by outside forces, and he is expected to conform to the tastes of his group. The younger child, on the other hand, does not yet have a clearly defined role, and is more at liberty to express a large range of preferences which do not necessarily have to be congruent with those of other children in his group.

A third deduction from developmental theory about the choice-making behavior of young children is that the young children will react more quickly to the choice material. This proposition is derived from Werner's description of the child's world as a world of action, where perception and direct motor action are still partially fused. To see two toys, according to this view, should call out some kind of direct behavior toward them. However, both Lewin and Werner indicate that,

while the young child acts impulsively, he does not act decisively. So the young child in a choice situation might be expected to change his mind after his choice, to point or glance quickly from one object to the other, or perhaps even to seize both toys at once.

In contrast, Lewin and Werner believe that the older child should be able to withhold action until he has had time to reach a decision. He should not be so overpowered by the valence of the objects that he is rushed into action before he has time to deal with the situation on a cognitive level. He should, according to Lewin, be capable of "that relative detachment and inward 'retirement' from the valence which is so favorable to perception of the whole situation" (17, p. 105) and "to display a relatively calm type of behavior while the conflict remains unsolved" (17, p. 112). This type of behavior would evolve from the older child's greater control of himself in relation to pressure from internal impulses and from external environmental pressures and in some measure from his ability to cope with the choice situation cognitively.

A fourth proposition is that the young child will probably be less influenced by differing valences of toys, as ranked by himself, than will the older child. He may tend to see the presentation of each pair of toys as a total situation in itself rather than seeing it as related to the preceding ranking situation. Away from the background of other toys, he may see toys which were formerly not too desirable as being very desirable when compared with a single other toy. The young child's world has not yet expanded logically, according to Baldwin, so he is still incapable of seeing what leads to what or how the isolated aspects of a situation fit together to form a total pattern.

The older child, however, with his larger time perspective and his greater ability to fit parts of a situation into a total pattern, may recognize toys in terms of those he expressed a preference for or against in an earlier situation. As a consequence his reactions to the toys in the later situation may be colored by his earlier expressions of choice.

In summary the propositions to be tested are:

1. The young child will be less stable in his choices both in an immediate situation and after an interval of time.

2. The young children will agree less among themselves on their preferences than the older children.

3. The young child will react more rapidly to the choice materials than the older child, but he will not act as decisively.

4. The young child's choices will be less influenced by differing valences of objects, as ranked by himself, than will the older child's choices.

CHAPTER IV

THE EXPERIMENTAL DESIGN

A. Subjects

In deciding what ages to use for the young and older groups of children, a number of child development texts (8, 9, 14, 25) were consulted, direct observations of the nursery school children were made, and pilot studies were conducted on children from three to eleven years old. Four years old was finally chosen as the age for the younger group and nine years old as the age for the older group.

Four years was selected as the age for the younger group because it was felt that younger children would not be able to follow instructions adequately. At the same time, for an optimum age differences comparison, it was necessary to use as young a group as could participate satisfactorily. For the older group nine years was chosen as the most representative age since nine-year-olds, according to Gesell (9) and others, have not yet reached preadolescence and so still retain their childhood interests and activities. This was an important consideration because it was necessary to supply experimental materials which would appeal to both age groups.

The younger group in the experiment was composed of thirty children from the University of Kansas Nursery school. There were sixteen girls and fourteen boys in the sample. Their average chronological age was four years with a range from three years to five years, four months. As a group they were intellectually superior with an average I.Q. of 131

on the Stanford Binet, form M, and the I.Q.'s ranged from 108 to 152.

Subjects in the older group were thirty fourth graders from the Pinckney public school of Lawrence, Kansas. There were fourteen girls and sixteen boys. The average age for the group was nine years, ten months. The youngest member of the group was nine years, three months and the oldest member was ten years, four months. Seventeen children in the older group had mental test scores based on the short form of the California Mental Maturity Test for elementary grades, and thirteen of the group had been tested with the Stanford-Binet, Form L. Since the correlation between the Stanford-Binet and the California Mental Maturity tests is .88 (27), the test scores were considered comparable and a total average I.Q. was computed. The mean for the group based on the two tests combined was 124 with scores ranging from 103 to 151.

It will be noted that the older group was more homogenous in relation to both age and intelligence. However, a Mann-Whitney critical ratio to test the significance of the difference between the means of the two groups in intelligence yielded a z-value of 1.82 which is not significant, but which could indicate a trend. This problem will be taken up more fully in the results and discussion chapters.

B. Procedure

The children were shown the experimental materials individually and an attempt was made to control the effects of performing the experiment at different times of day by working with about the same number of subjects in the morning and in the afternoon. For the younger group, especially, because of their fatigability, it seemed possible that time of day might be a disturbing factor. A few more nursery school children were tested in the afternoon than in the morning and several more grade school children performed the experiment in the morning than in the afternoon.

The younger children were shown the experimental materials in one of the rooms of the nursery school which occasionally serves as a playroom for them. A low children's table and chairs were present and the child was seated across from the experimenter. The experimental room for the older children was a "store-room" at the grade school, where many of them had been before for individual intelligence tests administered by university students. With them the physical arrangement was such that it was necessary for the subject to sit at the end of the standard height table and for the experimenter to sit at the side of the table. Lighting in both settings was excellent.

1. Ranking Procedure.

The choice materials used in the experiment were twelve ten cent toys. The selection of toys was designed to appeal to both boys and girls, to the older and younger children, and to a number of different interests within these groups. Table I lists the toys used and gives the experimenter's classifications.

FIGURE 1

Toys Employed in the Experiment

TABLE I

TOYS USED IN THE EXPERIMENT AS ARBITRARILY CLASSIFIED ACCORDING TO ASSUMED SEX PREFERENCES AND POSSIBLE USES

Girls' Toys	Boys' Toys	Either
Doll	Marbles	Pencil
Comb and Mirror	Gun	Paper
Jacks	Tank	Paints
		Telescope
		Puzzle
		Snake

Creative Possibilities	Games	Make-Believe
Paper	Marbles	Gun
Pencil	Jacks	Tank
Paints	Puzzle	Doll
		Comb set
		Snake
		Telescope

The child was brought into the room and asked to sit down. He was then shown all the toys which were displayed in a twenty by fifteen inch box with a hinged lid. The toys were presented in a fixed order in the box, and the box was presented to some subjects with the long side toward them, to others with the short side toward them. For a given subject the same manner of presentation was used for both the first and second rankings.

Each toy was pointed out to the child and if it could be played with or made a noise, as with the spy glass and the gun, the child was encouraged to try it for himself. He was also allowed to pick up any toy he wanted to in order to examine it more closely. Although the child was not allowed to become involved in any kind of game with the toys, he was given every opportunity to become aware of all of them and to explore their possibilities.

After the child's attention had been called to all of the toys and he had examined them and asked any questions he had about them, he was given the following instructions:

> Now I want you to look at all these toys very carefully. (At this point the experimenter made sure the subject actually looked at all the toys.) Pick out the one you think is the very nicest, the one that appeals to you most.

The child's choice was timed with a stop watch from the time the instructions were completed until he made his choice verbally or by pointing or by picking up the toy. The toy was then taken from the box and placed in a small box on a chair beside the experimenter out of the subject's sight.

The younger children were sometimes reluctant to relinquish a toy and they were allowed to play with it a moment or two before they were asked to put it in the box so the "game" could be continued. Only one of the older children played with toys of his choice. The younger children quickly accepted the experiment as a game and readily cooperated with the experimenter's requests when told that they were part of the "game." Within the game framework they were also able to accept such necessary limitations as not being allowed to open up the bag of marbles and not being allowed to keep any of the toys, since they understood that other children, too, would have to play with the materials. Older children who asked about the purpose of the experiment were told that it was an attempt to find out what kind of toys boys and girls of their age group liked.

As the toy was removed from the box, the experimenter lowered the lid, thus preventing the subject from looking at the toys except during the periods when his choices were being timed. The child continued to choose the toy he liked best of the ones remaining and each time his choice was timed and the toy removed from view until he had chosen all the toys. Pilot study results indicated that children of three cannot rank toys in the usual manner because they do not seem to be able to grasp the necessary concepts and tend to react to the task with expressions of bewilderment and frustration. But they were able to choose the one toy they liked best from a total group, even if they could not select a second, third, and fourth best when all the possibilities were left before them. So the present method was devised in order to secure

a system of preferential ranking of the toys which the young children could understand and perform.

2. Choice Procedure.

After the completion of the ranking a twenty inch by twenty inch cardboard screen was placed before the subject and he was told, "The next part of this game is a little different. It will take a minute to fix it up." The big toy box, now equipped with two trays, one for the three most liked toys and one for the three least liked toys, was placed on a chair beside the experimenter. The lid of the box was propped open and served as a screen to prevent the subject from seeing the toys in the box if he should happen to look around the screen on the table. The small box containing the rest of the toys was put out of sight. While the experimenter arranged the toys in the tray, she usually carried on a light conversation with the subject to maintain rapport and to keep him interested in the proceedings.

She then gave the following instructions:

> Now I'll tell what we are going to do. I'm going to put two toys behind the screen. Then I will say 'ready' and I will lift the screen—like this. (The experimenter here lifted the screen which has been between herself and the subject.) You look at both toys carefully and then tell me or point to the one you like the best. Remember, the important thing is to pick the one you like the very best each time. O. K.?

When the child indicated that he understood the instructions, (and none of the children seemed to have any difficulty understanding what was expected of them), the screen was replaced and the first pair of toys was put behind it. The screen was set so the toys would be within easy reaching distance of the child, about six inches back

from the edge of the table. The toys were placed approximately twelve inches apart just behind the screen. Timing with a stop watch began when the screen was lifted and stopped when the subject indicated a final choice. If the subject grabbed both toys or pointed quickly from one to the other, the time was noted for these choices as well as for the final choices, but choice time was defined as the period of time extending from the instant the screen was lifted until a final choice was indicated.

The order of presentation for the pairs of toys was randomized for each subject so that no two subjects in a group received the toys in exactly the same order. Randomization occurred for choices within the range of the top three most liked and the bottom three least liked toys as well as between the two valences of most and least liked as indicated by the ranking behavior. There were three pairs of toys for each of the two valences, the first and second choices (tenth and eleventh choices for the least liked valence), first and third choices (tenth and twelfth for the least liked valence), and second and third choices (eleventh and twelfth for the least liked valence). Each pair was presented twice, once with a given toy on the right and once with it on the left. Table II contains a sample order of presentation of the toys. There were twelve choices in all. By using the three most liked toys and the three least liked toys it was possible to compare behavior on choices involving the highly desirable and the less desirable toys.

TABLE II

A SAMPLE ORDER OF PRESENTATION OF TOYS
IN THE CHOICE SITUATION

Order	Valence	Toys
1	D	10, 11
2	L	1, 2
3	L	2, 3
4	D	12, 11
5	L	1, 3
6	D	11, 12
7	L	2, 1
8	L	3, 2
9	D	10, 12
10	D	11, 10
11	D	12, 10
12	L	3, 1

NOTE: D stands for any of the three least liked toys. L stands for any of the three most liked toys. The numbers 1, 2, and 3 stand for the first, second, and third ranking choices. The numbers 10, 11, and 12 stand for the tenth, eleventh, and twelfth choices. No other subject received the toys in this order.

A number of the younger children and one of the older children wanted to play with the object of their choice before giving it to the experimenter, and they were allowed to do so. After only a moment or two the experimenter suggested that the subject give her the toy so the game could continue. If the subject still did not want to give up the toy, he was told that he might play with it at the close of the experiment. Children in both groups were told how many trials were left when there were only three or four more. The younger children especially took a keen interest in knowing how many trials were left, although they frequently expressed regret that the experiment was over when they had made their last choice. At the close of the experiment each child in both groups was given a cookie as a reward for his participation.

3. Ranking Procedure Re-test.

The second part of the experiment took place from eight to eleven days later. At this time the subjects were again taken into the experimental room individually and shown the toys in the box. The same ranking procedure was followed as during the initial ranking situation and the materials were shown as nearly as possible at the same time of day as the presentation the week before. This completed the experiment for the younger children.

4. Interview with Older Children.

The older children were interviewed concerning their reactions to the toys and to the experimental procedure at the termination of the second ranking situation. When they had completed their final choice, the experimenter placed the toys back in the large box, though in no particular order. She then said:

> Well, that's about all there is to the experiment, but I would like to ask you a few questions. I am trying to find out what kind of toys boys and girls of your age like. I kind of took a shot in the dark when I bought these toys and I'd like to know how you feel about them. Do any of them seem too young for kids of your age or are there any that you like well enough to buy if you had some money, or what? I just don't have much of an idea what kind of toys kids your age like and I guess the best thing to do is to ask you.

It was not feasible to conduct a similar interview with the younger children. At the close of the experiment a number of them were accepting only with difficulty the idea that they could not keep some of the toys. To have asked them at this point to assume a hypothetical attitude about actually possessing the toys would have been demanding too much. Also, because of their greater spontaneity in approaching and

playing with the toys, it was much easier to deduce their reactions to the toys from their overt behavior.

Both groups again received cookies at the close of the experimental session.

CHAPTER V

RESULTS

A. Introduction

Although some studies based on modern conflict theory have used children as subjects, almost no experimenters have taken current theories of child development as a point of departure in planning their investigations of conflict or choice behavior. This experiment proposes to explore the area by testing a number of deductions about choice-making behavior based on the developmental theories of Baldwin, Lewin, and Werner.

The young child, as conceptualized by these psychologists, lives in a world where his perceptions, actions, and emotions are still partially undifferentiated. He meets the world with an emotional, not an intellectual approach. His feelings toward objects and people, rather than their objective qualities, determine how he will react to them. The dimension of time is still quite undifferentiated for him, so that only the present has concrete meaning for him. His behavior lacks the cognitive control which characterizes older children and adults and he is at the mercy of his own rapidly shifting inner needs and the pressures from the outside environment. He has not yet determined where objective reality ends and his own fantasies begin. In contrast to the older child whose psychological world is quite differentiated, the world of the young child is not well articulated in any respect.

With this conceptual view of the young child as a basis, the present experiment was designed to test the effects of increasing age upon ability to make choices. Chronological age was treated as the independent variable. Maturity, defined roughly as increasing differentiation of the life space, and valence were assumed to be intervening variables. The dependent variables were choice times between paired comparisons of the toys, ranking times, and stability of preferences.

The specific hypotheses tested were:

1. The young child will be less stable in his choices both in an immediate situation and after an interval of time.

2. The young children will agree less among themselves on their preferences than the older children.

3. The young child will react more rapidly to the choice material than the older child, but he will not act as decisively.

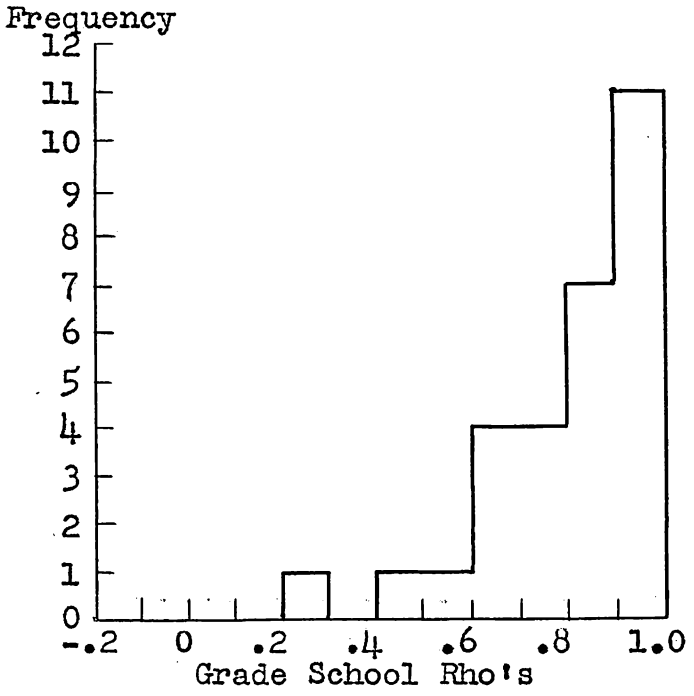
4. The young child will be less influenced in choice behavior by differing valences of the toys, as ranked by himself, than the older child.

Each child was presented with twelve pairs of toys and he was timed on each of his choices. For purposes of comparison his choice time scores were also broken down into the times for the most liked toys and times for the least liked toys. Each child ranked the twelve toys used in the experiment twice, giving him a total of twenty-four rankings. Each time he chose a toy in the ranking situation in the first test and in the re-test, he was timed, making twenty-two ranking times in all.

To analyze the data statistically it was necessary to reduce these scores to an appropriate statistic. Ordinarily the means of the choice times and of the ranking times would have been used as the best measures of central tendency for each subject. Since the data for many of the subjects were markedly skewed, the mean scores would have been highly misleading. Therefore median scores for the performances of each subject on choice times and ranking times were employed throughout the study as measures of central tendency.

As noted above each child ranked the toys in order of preference two times. Since the principal concern of the experiment was not to determine the specific toys which the children of the two age groups liked, but to determine how consistent they were in their choices, rank order correlations between the first and second orders of ranking were computed for each subject. These rho correlation coefficients were regarded as indices of preference stability and were treated as scores in later statistical analyses.

The frequency distributions of the choice time data and the correlations were both markedly skewed, violating the assumption of normality by distributed parent population which is essential for the use of normal probability statistics. Figure 2 presents the distributions of the individual correlations and Table III gives the variances of the choice times for the two groups and the corresponding F-tests for the homogeneity of variances. It will be noted that all of the F's are significant at less than the .001 level of confidence, the nursery school group having the larger variance in each case.



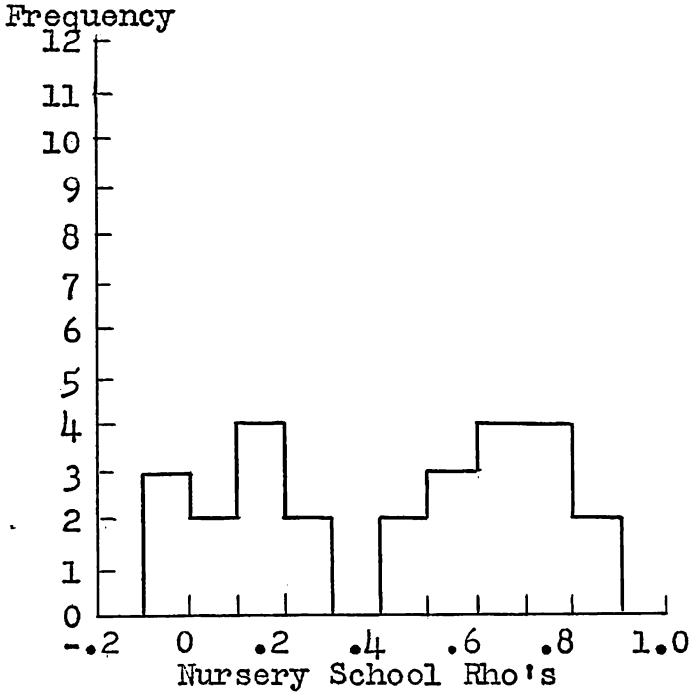


FIGURE 2

DISTRIBUTIONS OF INDIVIDUAL RANK ORDER CORRELATIONS FOR THE NURSERY SCHOOL AND GRADE SCHOOL SUBJECTS

TABLE III

NURSERY SCHOOL AND GRADE SCHOOL CHOICE TIME VARIANCES, FOR TOTAL CHOICE TIMES, FOR CHOICE TIMES ON THE MOST LIKED TOYS, AND FOR CHOICE TIMES ON THE LEAST LIKED TOYS

Total Choice Time Variances		
Group	Variance	F
N.S.	104.67	7.94***
G.S.	13.18	
Choice Time Variances for Most Liked Toys		
Group	Variance	F
N.S.	190.52	21.42***
G.S.	8.89	
Choice Time Variances for Least Liked Toys		
Group	Variance	F
N.S.	110.39	5.61***
G.S.	19.67	

*** $P < .001$

Since the assumptions underlying the use of non-parametric statistics could be met, they were used in the analyses of the data. The basic assumption which must be fulfilled when utilizing non-parametric statistics are that the data represent a random sample and that the measurements be continuous. Unlike the requirements for the use of normal probability statistics, nothing is assumed about the shapes and variances of the present populations.

The principal non-parametric techniques employed were Spearman's rank order correlations, Wilcoxon's T's for paired and unpaired replicates (32), coefficients of concordance (16), the Mann-Whitney critical ratio test (29), and the sign test (29). Wilcoxon's T is a test of significance for the difference between means and the sums of ranks are used in its computation. An equal number of subjects are required in the two groups being compared. The Mann-Whitney critical ratio is an extension of Wilcoxon's T which can be applied when the two groups being compared have unequal numbers of subjects. The coefficient of concordance, or W, is a non-parametric statistic which indicates the amount of agreement in a group of rankings. With the present set of data W's were used to determine how closely each group of subjects agreed among themselves on their orders of preferences for the twelve toys. The limiting values of W range from zero to one, zero representing no agreement among subjects on their rankings of a number of objects and one representing perfect agreement. The sign test is a test of the significance of the difference between two sets of scores which are obtained from the same subjects tested on two occasions or from matched subjects.

B. Findings on Stability of Preference for Older and Younger Children in Three Situations

1. The Delayed or Ranking Situation.

To check the stability of choice the test-retest method was employed, i.e., the children ranked the toys at the beginning of the experiment and again from eight to eleven days later. The mean rank order correlation for the nursery school group was .41 and the mean rank order correlation for the grade school group was .80. The mean grade school correlation indicated a degree of agreement between first and second rankings at greater than the .001 level of confidence and the mean nursery school correlation was significant at the .045 level. While both groups displayed a significant amount of consistency in choices from the first to the second ranking, the older group was much more likely to choose toys in nearly the same order of preference on the second test.

Figure 2 presents the distribution of rhos for the two groups. The young children's scores fall into a roughly bi-modal distribution, while the grade school children's scores are concentrated at the upper tail of the distribution. The grade school children as a group were decidedly consistent in their preferences from one ranking situation to the next. The nursery school children, in contrast, were extremely variable, with three children shifting their orders of preference so much from the first to the second ranking that they showed a slight tendency to reverse the order, as indicated by the negative correlations. Two other young children were more consistent in their choices from the first to the second ranking than approximately one-third of the grade school children.

The hypothesis that the older children would manifest greater stability in their object ranking than the nursery school children was tested by Wilcoxon's T test for unpaired replicates. The resulting critical ratio of 4.91 indicates that the obtained difference between the average rhos for the two groups would be expected to occur by chance far less than once in a thousand times. It may be concluded, therefore, with considerable assurance, that the older children show greater stability of preference.

2. The Immediate Situation.

The above results indicate that young children are more unstable than older children in their statements of preference when an interval of approximately a week separates the re-test of their choices. But the original proposition also suggested that the choices of the young children would be less stable than those of the older children if they were re-tested after a shorter period of time. To test this possibility a comparison was made between choices expressed on the first ranking and choices made a few minutes later on the paired comparisons part of the experiment. If in the paired comparisons situation the child chose the toy he had ranked higher a few minutes before, it was scored a consistent choice. If in the paired comparison he chose the toy he had ranked lower before, he was considered inconsistent. The number of consistent and inconsistent choices were recorded for each child and a chi square was computed to determine if the data of the nursery school group and the grade school children were independent. The frequencies of consistent and inconsistent choices for each subject within each group are presented in Table IV.

TABLE IV

FREQUENCIES OF CONSISTENT AND INCONSISTENT CHOICES FOR GRADE SCHOOL AND NURSERY SCHOOL CHILDREN: THE PAIRED COMPARISONS CHOICES IN RELATION TO THE PRECEDING RANKING CHOICES

Group	Consistent		Inconsistent
	12/0-10/2	9/3-7/5	6/6-4/8
N.S.	3	18	9
G.S.	17	9	4

$X^2 = 14.72$ $P < .01$.

NOTE: A child was considered consistent if he chose a toy in the paired comparisons situation which he had ranked higher in the preceding ranking situation. He was considered inconsistent if he chose the one of a pair of toys which he had ranked lower in the ranking procedure. In the table 12/0-10/2 would indicate that a child had always chosen the higher ranked toy of the pair or that he did so every time but twice. Numbers in the table represent frequency of subjects in the category.

The chi square of 14.72 which is significant at less than the .01 level of confidence suggests that the groups were not equally consistent. Rather, the nursery school children were significantly less consistent than the grade school children when given an opportunity to make choices after a short period of time just as they were when a longer time interval separated the test and re-test.

3. Stability of Preferences within the Two Groups.

In the two preceding sections the problem of stability of choice as it relates to variablity of single subjects from one presentation of choices to the next has been considered. However, another aspect of the problem is the variation in toy preferences within each age group. It is possible that nearly all of the subjects within an age group may tend

to rank the toys in the same order of preference, or conversely, the orders of preference may vary greatly from individual to individual. Coefficients of concordance based on the orders of preference given in the first rankings were computed. The first rankings rather than second rankings were used because they represented the child's initial, naive reactions to the toys.

In view of the general behavior of the young children it seemed probable that they would differ more among themselves in their orders of preference than the older children. The reactions of the older boys to the experimental material suggested that they might be more consistent than the girls in the older age group.

In an attempt to answer these questions coefficients of concordance were computed on first orders of preferences for the nursery school group as a whole, the fourth graders as a group, the nursery school boys, the nursery school girls, the fourth grade boys and the fourth grade girls. To test the significance of the W's, they were transformed into F's and evaluated by the F-distribution. The results of these analyses are presented in Table V.

TABLE V

COEFFICIENTS OF CONCORDANCE ON TOY PREFERENCES, FOR THE WHOLE NURSERY SCHOOL GROUP, THE WHOLE GRADE SCHOOL GROUP, THE NURSERY SCHOOL BOYS, THE NURSERY SCHOOL GIRLS, THE GRADE SCHOOL BOYS, AND THE GRADE SCHOOL GIRLS

Group	W	F
N.S. Total	.205	7.48***
G.S. Total	.233	8.79***
N.S. Boys	.301	5.60***
N.S. Girls	.215	4.11***
G.S. Boys	.599	22.41***
G.S. Girls	.465	11.30***

*** $P < .001$

Contrary to the hypothesis stated above, that the older children would be more consistent than the younger children, the fourth graders appear to have agreed among themselves on their preferences only slightly more than the younger children. The W for the nursery school group was .205, and the grade school group had a W of .233. But when the groups were broken down according to sex, rather large differences were revealed between the older boys and girls with smaller differences between the younger boys and girls. The grade school girls obtained a W of .465 and the W for the grade school boys was .599. In the nursery group the W for the girls was .215, while it was a .301 for the boys. Since the grade school boys were displaying a consistent order of preference for certain toys while the girls were showing a consistent order for different toys, the real stability of the group was concealed. The boys of the nursery school group agreed more on their orders of preference than the girls. As there is no way to test the significance of differences between W's, it can not be stated conclusively that boys are more stable as a group in expressions of preference than girls, but a decided trend in this direction is indicated. ☆

An examination of the raw data revealed that the greater consistency of the older boys may have been caused in part by their pronounced reactions to two toys, a small celluloid doll and a comb and mirror set. In every case but one the older boys ranked these toys very near the bottom of the preference hierarchy and often expressed their dislike verbally.

C. The Influence of Valence on the Choice Behavior of the Two Age Groups

The original proposition, derived from developmental theory, stated that the choice behavior of the young child would be less influenced by differing valences than would the choice behavior of the older child. The data may be examined to see whether or not this hypothesis is substantiated. The mean of the median choice times for the nursery school group on the most liked toys was 4.01 seconds; for the least liked toys the mean was 4.07 seconds. The sign test computed on the differences indicated that they were not significant, showing that the nursery school subjects chose toys as rapidly when they had ranked them high as when they had ranked them low. The grade school children, on the other hand, took significantly longer to choose toys they had ranked low than those which they had ranked high. The mean for their median choice times on most liked toys was 1.82 seconds, while it took them an average of 2.97 seconds to make a choice between the least liked toys. A sign test revealed that the differences were significant at the .002 level.

Comparisons of the mean choice times on the most liked toys between the grade school and the nursery school children disclosed differences to be significant at the .001 level as tested by Wilcoxon's T. The nursery school subjects took much longer to decide which of two liked toys they preferred than did the grade school children. This distinction continued to exist when comparisons were made between the two groups for the toys they liked least. Again the nursery school children were slower in their choices with the difference between the groups

being significant at the .001 level. All these comparisons are summarized in Table VI.

TABLE VI

THE INFLUENCE OF VALENCE ON CHOICE TIME: COMPARISONS OF CHOICE TIMES FOR THE NURSERY SCHOOL AND GRADE SCHOOL CHILDREN ON MOST LIKED TOYS AND LEAST LIKED TOYS BOTH WITHIN EACH GROUP AND BETWEEN GROUPS

Within Groups			
Group	Valence of Toys	Mean Choice Time	Difference
N.S.	Most Liked	4.07	.06
	Least Liked	4.01	
G.S.	Most Liked	1.82	.25**
	Least Liked	2.07	
Between Groups for Most Liked Toys			
Group		Mean Choice Time	Difference
N.S.		4.07	2.25***
G.S.		1.82	
Between Groups for Least Liked Toys			
Group		Mean Choice Time	Difference
N.S.		4.01	1.94***
G.S.		2.07	

** $P < .002$ *** $P < .001$

In addition to the role which the valence of the toys played in the choice times, it also affected the stability of choices between preferences expressed in the first ranking and the preferences demonstrated in the immediately following paired comparisons situation. As

in the over-all test of stability between rankings and paired comparisons, the number of consistent and inconsistent choices for both the most liked and least liked toys were recorded and two chi squares were computed for the two classifications of toys, comparing the nursery school children with the fourth graders in each case. Tables VII and VIII give these data.

TABLE VII

FREQUENCIES OF CONSISTENT AND INCONSISTENT CHOICES ON BEST LIKED TOYS FOR GRADE SCHOOL AND NURSERY SCHOOL CHILDREN: THE PAIRED COMPARISONS CHOICES IN RELATION TO THE PRECEDING RANKING CHOICES

Group	Consistent		Inconsistent
	6/0-5/1	4/2-3/3	2/4-1/5
N.S.	7	17	6
G.S.	17	9	4

$X^2 = 7.07$ $P = .03$

NOTE: A child was considered consistent if he chose a toy in the paired comparisons situation which he had ranked higher in the preceding ranking situation. He was considered inconsistent if he chose the one of a pair of toys which he had ranked lower in the ranking procedure. In the table 6/10-5/1 would indicate that a child had always chosen the higher ranked toy of the pair or that he did so every time but once. Numbers in the table represent frequency of subjects in the category

The comparative instability of the young children was suggested in their choices of most liked toys and least liked toys. The chi square of 7.07 for the most liked toys is significant at the .03 level, while the chi square of 5.66 for the least liked toys is significant at the .06 level.

TABLE VIII

FREQUENCIES OF CONSISTENT AND INCONSISTENT CHOICES ON LEAST LIKED TOYS FOR GRADE SCHOOL AND NURSERY SCHOOL CHILDREN: THE PAIRED COMPARISONS CHOICES IN RELATION TO THE PRECEDING RANKING CHOICES

Group	Consistent		Inconsistent
	6/0-5/1	4/2-3/3	2/4-1/5
N.S.	9	16	5
G.S.	18	10	2

$X^2 = 5.66$ $P = .06$

Although the young children were less consistent than the older children in their choices of most liked and least liked toys, an examination of the frequency tables reveals that they did perform with some consistency. Only about one sixth of the nursery school children's scores fell into the categories of pronounced inconsistency on the least liked toys and one fifth on the most liked toys, where they reversed their choices more often than they supported them. This indicates that while their behavior lacked the consistency of the older children's, it could not be considered random.

D. Comparisons of Reaction Times for the Two Groups

It was hypothesized in the discussion of young children's choice behavior that they would react more rapidly to the choice material than the older children, but with less decisiveness. When the ranking times for the nursery school subjects and the fourth graders were compared, it was found that the young children chose more rapidly than the older children when confronted with the whole array of toys in the first ranking situation. The mean time for the nursery school children was 2.39 seconds while the grade school children took 3.43 seconds to make their decisions. There was essentially no difference between the two groups on second ranking times.

When the total choice times for the two groups were compared for the paired comparisons situation, a large and significant difference was revealed, with the young children responding much more slowly than the older children. The mean for the nursery school group was 3.91 seconds while the mean for the grade school children was 1.95 seconds. The difference was significant at less than the .001 level of confidence. Table IX summarizes these results.

An examination of the qualitative behavior of the young and older children confirmed the belief that the young children would behave less decisively than the older children. The qualitative behavior was categorized into decisive and indecisive actions. Choice behavior was considered indecisive if the child grabbed both toys and had to be reminded that he could only choose one, or if he verbally expressed a

TABLE IX

COMPARISONS OF NURSERY SCHOOL AND GRADE SCHOOL CHILDREN ON SPEED OF CHOICE: WILCOXON'S T'S ON FIRST RANKING TIMES, SECOND RANKING TIMES AND CHOICE TIME ON ALL TOYS

First Ranking Time in Seconds		
Group	Mean	Difference
N.S.	2.39	1.04**
G.S.	3.43	
Second Ranking Time in Seconds		
Group	Mean	Difference
N.S.	2.15	.10
G.S.	2.05	
Choice Time on All Toys		
Group	Mean	Difference
N.S.	3.91	1.96***
G.S.	1.95	

** P < .01. *** P < .001.

desire to have both toys and did not choose one, or if he wavered between the two toys, first choosing one and then the other. Table X contains the frequency distribution from which a chi square between the nursery school group and the grade school group was computed. The chi square was 11.14, significant at less than the .001 level of confidence. Within the indecisive classification there were qualitative

TABLE X

FREQUENCIES OF DECISIVE AND INDECISIVE SUBJECTS IN THE GRADE SCHOOL AND NURSERY SCHOOL GROUPS ON THE PAIRED COMPARISONS CHOICES

Group	Decisive	Indecisive
N.S.	15	15
G.S.	26	4

$X^2 = 11.14$ $P < .001$

differences between the two groups. For the nursery school children seven or nearly one half of the number showing indecisive behavior were placed in this category because they grabbed both toys. No subject in the grade school group engaged in this type of behavior.

Choice time was originally defined as the time elapsing between the presentation of the pairs of toys and the child's final choice of a toy. However, the time was also recorded if the child grabbed both toys or indicated first one choice and then the other. For the children who had both first and final reaction times, median times using first reaction times were computed. These medians were then substituted for the final reaction times and the differences between the nursery school children and the grade school children for most liked, least liked, and total choice times were computed again. The purpose of the re-computation was to determine whether use of the first reaction times would change the relationship between the performances of the two groups, i.e., whether the nursery school children would have faster choice times than the grade school children if first reaction

times rather than final reaction times were used in the comparisons. All differences between the two groups remained significant at the .001 level with the nursery school children still being slower in their choices.

E. The Relationship between Intelligence within Each Group to Choice Behavior

Rank order correlations were computed for the nursery school subjects and for the grade school subjects between I.Q.'s, rhos, first ranking times, and total choice times. Table XI contains a summary of the correlations.

TABLE XI

RANK ORDER CORRELATIONS BETWEEN INTELLIGENCE QUOTIENTS AND RHOS, TOTAL CHOICE TIMES, AND FIRST RANKING TIMES

Variables	Correlation	Critical Ratio
I.Q and Rhos		
N.S.	.23	1.15
G.S.	.33	1.74
I.Q. and Total Choice Time		
N.S.	-.18	.99
G.S.	.10	.55
I.Q. and First Ranking Time		
N.S.	-.21	1.10
G.S.	.24	1.31

Correlations were run between I.Q.'s and the other data to find out if intelligence was related to stability of preference as represented by the rhos and rapidity of choice-making as indicated by the first ranking times and total choice times. The hypothesized outcome was that the brighter children of both groups would be more consistent

in their choices than the less bright children. This hypothesis was not supported, since the correlation between the I.Q.'s and rhos was .23 for the younger children and .33 for the older children. Neither correlation indicates a significant relationship between intelligence and stability as represented by the rhos.

The brighter children were also expected to take longer in making their choices, since it was presumed that they would have more cognitive control over their behavior and consequently would not behave as impulsively as the less bright children. This hypothesis was not supported by the correlations in either group. The correlation between I.Q. and total choice time for the nursery group was -.18; for the grade school group it was .10. When I.Q.'s were correlated with first ranking times the results were similar. The nursery school group had a correlation of -.21 and the grade school subjects had a correlation of .24. None of these correlations indicated a significant amount of relationship between intelligence and choice time.

In general, age and intelligence differences within a given age group appear to be only slightly related to choice-making behavior.

F. Sex Differences and Choice-Making Behavior

To investigate the possibility that boys and girls of the two age groups might be reacting differently in the choice situations, Mann-Whitney critical ratios were computed on the means of the boys and the girls for each group for choice times, ranking times, and rhos. These critical ratios are presented in Table XII.

Differences for the total choice times and the choice times for the best liked toys between boys and girls were not significant for either the young children or the fourth graders. But the difference between the grade school boys and girls on the least liked toys approached significance with a critical ratio of 1.91, the girls taking the longer times to choose.

A significant difference between the grade school boys and girls on stability as measured by the individual rhos was found, the boys being more consistent. This indicates that not only are fourth grade boys more like each other in their toy preferences than girls their own age and younger children, as shown by the W's discussed earlier, but as individuals they are also more consistent.

Sex differences in stability of choice did not appear in the nursery school group. There were also no significant sex differences in the performance of either group on the first ranking times.

TABLE XII

MANN-WHITNEY CRITICAL RATIOS ON SIGNIFICANCES OF DIFFERENCES OF MEANS BETWEEN BOYS AND GIRLS FOR THE NURSERY SCHOOL AND GRADE SCHOOL GROUPS: FOR TOTAL CHOICE TIME CHOICE TIME FOR THE MOST LIKED TOYS, CHOICE TIME FOR THE LEAST LIKED TOYS, RHOS, AND FIRST RANKING TIMES

Total Choice Time			
Group	Means		Critical Ratio
N.S.	Boys 4.05	Girls 3.80	1.07
G.S.	Boys 1.96	Girls 2.21	1.66
Choice Times for Most Liked Toys			
Group	Means		Critical Ratio
N.S.	Boys 3.62	Girls 3.51	.07
G.S.	Boys 1.73	Girls 1.98	1.06
Choice Time for Least Liked Toys			
Group	Means		Critical Ratio
N.S.	Boys 4.04	Girls 3.98	.03
G.S.	Boys 1.75	Girls 2.43	1.91
Rhos			
Group	Means		Critical Ratio
N.S.	Boys .499	Girls .344	1.32
G.S.	Boys .838	Girls .748	2.03*
First Ranking Time			
Group	Means		Critical Ratio
N.S.	Boys 2.55	Girls 2.25	.02
G.S.	Boys 3.62	Girls 3.21	.09

* P = .045

G. Relationships with Groups Matched for Intelligence and Age

Subjects in the two groups were very well matched, considering the practical difficulties in obtaining subjects of the specified ages and levels of intelligence. In order to cause as little disruption as possible in the grade school program, it was necessary to use children from only one grade as subjects for the older group in the experiment. Even within these limitations a group of thirty grade school children were found whose I.Q. range was similar to the nursery school subjects and whose average level of intelligence matched the nursery school children within seven points.

The differences reported between the two groups have been large and significant on all forms of choice-behavior investigated. The criticism might be raised that these differences were simply a result of unequal age ranges between the two groups and of different levels of intelligence. It is important, therefore, to assess the possible effects of these factors.

Subjects from the two groups were matched on the basis of intelligence, using only subjects with I.Q.'s the same as a subject in the other group or differing only one point from it. The age range of the nursery school children included two years and one month, while the age range for the grade school children covered only one year and one month. Therefore, it was necessary to divide the nursery school group into the three years, three months to four years, four months old group and the four years, three months to five years, four months old group and to match subjects from the grade school group with both of these

nursery school groups. Results of these analyses are presented in Tables XIII and XIV.

A comparison of the mean rhos for the two groups matched on I.Q.'s had the effect of raising both means, but not of altering their relationship to each other. When means were computed on the choice time data for total choice time, time on the most liked toys, and time on the least liked toys, the means were also increased in both groups. However, in this case, the means of the nursery school increased considerably more than those of the grade school children. This indicates that with intelligence held constant differences between the two groups become even more widely separated. With the first ranking time data, however, the means of the two groups were not as widely separated with the groups matched. A Wilcoxon's T test for matched pairs indicated that the matched groups were not significantly different from each other. However, the criterion for matching was very strict and there were only ten subjects in each group, as contrasted with thirty in each of the total groups, which would indicate that much of the original data was being disregarded in making this comparison.

When mean rhos for the two groups were re-computed, holding the age range constant, only slight variations from the original means occurred, with the exception of the younger nursery school subjects, who were less consistent than the nursery school children a year older or the grade school children. A Mann-Whitney critical ratio of .43 between the three-to-four year olds and the four-to-five year olds indicated that the two groups were similar enough to have come from the same population.

TABLE XIII

COMPARISONS OF THE MEANS OF THE TWO GROUPS MATCHED FOR INTELLIGENCE WITH MEANS OF THE TOTAL GROUPS: FOR RHOS, TOTAL CHOICE TIMES, CHOICE TIMES FOR THE MOST LIKED TOYS, CHOICE TIMES FOR THE LEAST LIKED TOYS, AND FIRST RANKING TIMES. N FOR THE MATCHED GROUPS = 12

Group	Corrected Mean Rho	Original	Difference
N.S.	.51	.41	+.10
G.S.	.94	.80	+.14
Group	**Corrected Mean Total Choice Time**	**Original**	**Difference**
N.S.	4.58	3.91	+.67
G.S.	2.08	1.95	+.13
Group	**Corrected Mean Time For Most Liked Toys**	**Original**	**Difference**
N.S.	4.79	4.07	+.72
G.S.	1.87	1.82	+.05
Group	**Corrected Mean Time For Least Liked Toys**	**Original**	**Difference**
N.S.	4.62	4.01	+.61
G.S.	2.29	2.07	+.22
Group	**Corrected Mean Time For First Ranking**	**Original**	**Difference**
N.S.	2.75	2.39	+.36
G.S.	3.38	3.43	-.05

TABLE XIV

COMPARISONS OF THE MEANS OF THE TWO GROUPS MATCHED FOR AGE RANGES WITH MEANS OF THE TOTAL GROUPS: FOR RHOS, TOTAL CHOICE TIMES, CHOICE TIMES FOR THE MOST LIKED TOYS, CHOICE TIMES FOR THE LEAST LIKED TOYS, AND FIRST RANKING TIMES. N FOR THE 4-4 TO 5-4-YEAR-OLD GROUP = 19. N FOR THE 3-3 TO 4-4 YEAR-OLD GROUP = 10

Group	Corrected Mean Rho	Original	Difference
Nursery School			
4-3 to 5-4's	.422	.410	+.012
3-3 to 4-4's	.318	.410	-.092
Grade School Matched with			
4-3 to 5-4's	.784	.797	-.013
Matched with 3-3 to 4-4's	.745	.797	-.052
Group	**Corrected Mean Total Choice Time**	**Original**	**Difference**
Nursery School			
4-3 to 5-4's	4.20	3.91	+.29
3-3 to 4-4's	3.75	3.91	-.16
Grade School Matched with			
4-3 to 5-4's	1.96	1.95	+.01
Matched with 3-3 to 4-4's	1.98	1.95	+.03
Group	**Corrected Mean Times For Most Liked Toys**	**Original**	**Difference**
Nursery School			
4-3 to 5-4's	4.47	4.07	+.40
3-3 to 4-4's	3.75	4.07	-.32
Grade School Matched with			
4-3 to 5-4's	1.87	1.82	+.05
Matched with 3-3 to 4-4's	1.88	1.82	.06

TABLE XIV, CONTINUED

Group	Corrected Mean Time For Least Liked Toys	Original	Difference
Nursery School			
4-3 to 5-4's	4.29	4.01	+.28
3-3 to 4-4's	3.80	4.01	-.21
Grade School Matched with			
4-3 to 5-4's	2.04	2.07	-.03
Matched with 3-3 to 4-4's	2.05	2.07	-.02

Group	Corrected Mean Time For First Ranking	Original	Difference
Nursery School			
4-3 to 5-4's	2.43	2.39	+.04
3-3 to 4-4's	2.20	2.39	-.19
Grade School Matched with			
4-3 to 5-4's	3.61	3.43	+.18
Matched with 3-3 to 4-4's	3.05	3.43	+.38

When first ranking times were compared with the groups matched for age ranges, the shifts in the means were slight and the relationships between the two groups remained approximately the same. Matchings for age range on the choice time data for the most liked, least liked, and total choice times made no appreciable difference in the mean times for the grade school children. But the older nursery school children had means for the three categories which were above means based on the total group, while the younger nursery school children had means which were lower than the total group means. This suggested that the three-to-fours might differ significantly from the four-to-fives, particularly on the choice times for the most liked toys. But a Mann-Whitney critical ratio of 1.08 between the two sub-groups of the nursery school subjects on most liked toys indicated that the hypothesis that both groups were from the same population was tenable.

In general, these findings indicate that differences between the groups on choice-making behavior cannot be attributed to differences occurring between the groups on levels of intelligence or age ranges.

H. Qualitative Aspects of Choice-Making Behavior

1. Reactions to the Procedure.

The young and older children indicated both verbally and by their general behavior that they enjoyed the experiment. The nursery school subjects were more overt than the older children in their expressions of interest. They were often reluctant to leave the experimental room when the experiment was completed or they asked for another turn when the experimenter came to the nursery school on the next day. Also the subjects who had already taken part in the experiment assured those who had not that "the game" was "fun" or "nice."

The older children did not regard the experiment as a game, but they were interested in its purpose and volunteered numerous hypotheses about the reasons for doing it and the best ways for them to react in the situation. The attitude expressed by many of the older children was well summarized by one of the boys in the group, "You may not believe this," he said, "but this is pretty interesting!" As in the younger group, several of the older children expressed disappointment when they learned that the paired comparisons would not be a part of the second experimental session. Both groups accepted the cookies at the close of the first and second experimental sessions with enthusiasm.

2. Qualitative Observations on the Valence of the Toys for the Two Groups.

The younger children quickly became involved with the toys and frequently made such comments as: "I like to paint. Can't we paint?" "Can't I take this down stairs for a little while?" and "I just love

snakes." Although the older children were in general more reserved in their approach to the toys, they also displayed spontaneous pleasure in the toys as is exemplified by the comment of one of the boys. On the first ranking he had a difficult time making a first choice because five of the toys were equally attractive to him. At the end of the experiment he said, "I'd sure like to have some of those things. Some are pretty nice!" Another boy asked if the "dime" store still had toy snakes and added that if he could get twenty cents, he would buy two of them.

Both groups of children had definite dislikes as well as likes. After choosing the first ten toys in the ranking situation, one child in the nursery school group looked up when the lid of the box opened on the last two toys and said, "I don't have any choosers now." Two other nursery school children indicated at some point in the ranking procedure that they could make no more choices because, "I've chosen all the nice things" or "I don't like any of these very well." The older boys' dislike of the doll and the comb and mirror set was mentioned in an earlier section. A few of the boys found it extremely distasteful to make a choice between these two toys. One boy, after asking if he had to choose one of them, when they were the only toys left, closed his eyes and grabbed at random.

A breakdown of the material gathered from the interviews with the older children is given in Table XV. The data are classified according to (1) sex difference, (2) toys which the fourth graders judged too young for members of their age group, and (3) toys which

they liked well enough to buy if they had some money. Since the children were not asked to make judgements of every toy used in the experiment, some of them indicated only the toys they liked well enough to buy or the ones they felt were too young for their group, making no statements about the remaining toys. Consequently, every subject did not make a judgment about every toy and the totals in Table XV do not represent the total group's judgment of each toy, but only those of the children who voluntarily specified the particular toy. It may be assumed that the rest of the group felt that the toy was all right for their age group, but that they did not like it well enough to buy it.

The table indicates that no child thought the paper and pencil were too young for their age group and only one child believed the jacks, the key chain puzzle, and the marbles were too young for fourth graders. The comb and mirror set and the doll were not popular toys with either the boys or the girls, since the majority of the subjects believed they were for younger children. The three toys appealing most to the group were the jacks, the spy glass, and the marbles. Only one subject reported that none of the toys interested him, while two of the children thought that all the toys were suitable for their age group. One boy, when asked if there were any toys he would buy if he had some money, said that he would buy the spy glass if he had enough money, indicating that he thought it a rather expensive toy. Another boy, however, surveyed the toys, then asked if they each cost ten cents.

The subjects in each group experienced conflict in making choices in both the ranking situation and the paired comparisons situation, as

TABLE XV

TOYS PREFERENCES OF GRADE SCHOOL BOYS AND GRADE SCHOOL GIRLS AS EXPRESSED IN THE INTERVIEW SITUATION

Toys		Boys	Girls	Total
A. Pencil:	Would Buy	2	2	4
	Too Young	0	0	0
B. Jacks:	Would Buy	2	14	16
	Too Young	0	1	1
C. Snake:	Would Buy	6	3	9
	Too Young	3	4	7
D. Ray Gun:	Would Buy	6	2	8
	Too Young	4	4	8
E. Spy Glass:	Would Buy	11	6	17
	Too Young	2	2	4
F. Tank:	Would Buy	6	3	9
	Too Young	1	3	4
G. Puzzle:	Would Buy	6	6	12
	Too Young	1	0	1
H. Paper Pad:	Would Buy	6	7	13
	Too Young	0	0	0
I. Marbles:	Would Buy	9	5	14
	Too Young	1	0	1
J. Paints:	Would Buy	6	5	11
	Too Young	2	3	5
K. Doll:	Would Buy	0	4	4
	Too Young	7	9	16
L. Comb and Mirror:	Would Buy	1	3	4
	Too Young	6	6	12

shown by their comments and general behavior. The grade school children appeared to have more difficulty making decisions when the task involved choosing two disliked toys. Several children shook their heads in a perplexed manner when confronted with such a choice, and several others exclaimed "Oh, no!"

The nursery school children displayed a slight tendency toward a greater expression of conflict when the choice had to be made between toys they liked very much. Typical of the comments made in this situation were the following. "This is hard 'cause I like both of them" and "I can't point (when instructed to point to one of the pair of toys he liked best) because I don't know!" A few of the young children became quite indignant when pressed for a decision. One four-year-old said ☆ impatiently, "You know I like both best!"

3. Qualitative Observations on Stability of Preference.

In several cases, when asked to choose the toy they liked best, the young children replied, "I like them all best," but they were able to select the one they preferred after a short period of time. At the other extreme one of the nursery school children stated that he liked the snake best and declared that he would choose it whenever it was presented. In contrast to the generally inconsistent choice behavior of his age group, he did choose the snake each time it was presented and on a number of trials requested that it be placed behind the screen so that he could choose it more times. Most of the nursery school children were not as fixated on one toy as this child, nor as undifferentiated in their tastes as the children in the first example.

Some of the older children also had highly stabilized toy preferences. One boy stated after a few of the pairs had been presented to him, "Now you know which one I really like. Whenever you put the spy glass out, I'll take it unless you put down the marbles."

Both groups presented some examples of marked instability of choice as well. The most outstanding illustration of this tendency on part of the nursery school subjects was given by a three-and-a-half year old girl. During the first ranking situation she had chosen the snake last. Eight days later she chose the snake third and exclaimed, "I just love snakes!"

Such striking shifts in preference did not occur in the choice behavior of the older children, but the interview situation with them brought out some trends toward inconsistency. Several children stated that they liked a given toy well enough to purchase it if they had some money, but when asked if they believed any of the toys were too young for children of their age, they listed one of their favorites among those they deemed too young for fourth graders. None of the children engaging in this type of behavior appeared to notice the implications of this dual classification and none made an attempt to rationalize the fact that they had stated a preference for a toy which they later rejected as being suitable for children younger than themselves.

4. Qualitative Observations on Rapidity of Approach to the Toys.

One of the outstanding and most readily apparent differences between the nursery school children and the older children was the greater involvement of the younger children. As soon as the younger children came into the room and saw the toys, many of them rushed to the table and began to examine them. In the course of becoming acquainted with

the toys before they made their rankings, they spontaneously and rapidly employed them in a variety of ways. The ray gun was used several times to shoot the experimenter; the toy box was "painted" with each of the water color paints by rubbing the cake of color with a forefinger, then pretending to streak color across the box; the toy tank was wound up and run across the floor. A few of the younger children appeared to be quite inhibited in their approach to the toys by the presence of the experimenter, but characteristically the toys seemed to capture their attention and propel them into action.

The older children approached the task with a certain amount of reserve, as if it were a test situation. They usually did not touch the toys at all or if they did lift them from the box, it was for the purpose of examining a particular aspect of the toy. Only one child in the older group entered into play with the toys as actively as the younger children did.

5. Other Qualitative Differences between the Groups.

The greater involvement of the younger children was demonstrated by their attempts to anticipate what toys would be placed behind the screen. Many of them were also keenly aware of repeated presentations of pairs of toys. Some of the nursery school children seemed to desire to control the experimental situation by telling the experimenter what toys to place behind the screen. The youngest child in the group developed a strong preference for the comb and mirror set and demanded several times that it be shown to her next. When it actually appeared once after she had requested it, she first expressed surprise, then delight.

Another child objected when the same pair of toys appeared more than one time and told the experimenter not to give him the pair again. When the same toys did appear again, he exclaimed with considerable negative feeling, "The same again!"

The older children were aware that the toys appeared in a certain arbitrary order and did not attempt to change it, although a few of them did attempt to guess what toys the experimenter would next place behind the screen.

Several of the phenomena described by Werner (31) and other theorists in child development appeared in the behavior of the younger children. A suggestion of animism occurred in the behavior of a boy, three years, ten months old. He had chosen the snake in one of the paired comparisons, then asked, "Did the snake used to be real?" Although the young children characteristically displayed a general lack of differentiation in their choices, one four-year-old girl engaged in the use of isolated detail which Werner mentions. Rather than selecting the card of jacks and the ball as a unit, she specified one time that she was just choosing the ball and another time that she was choosing only one particular jack.

CHAPTER VI

DISCUSSION

A. Summary of Results

With one exception the findings of this experiment have confirmed the original hypotheses which it was designed to investigate. The younger group of children displayed significantly more instability in their expressions of preferences both from one week to the next and within a short period of time. As a group they differed more from each other in their toy preferences than the older children. Unlike the older children, who found it more difficult to make choices between pairs of toys they disliked, the valence of toys, as ranked by themselves, did not influence the choices of the younger children. The younger children were significantly faster than the older children in ranking the toys the first time, supporting the hypothesis that they would react more rapidly toward the toys. But, contrary to the original hypothesis, they took significantly longer to make choices when deciding between a pair of toys. Intelligence was not related to stability of toy preferences or speed of choice for either the nursery school or the grade school group. The grade school boys were more consistent in their choice behavior than girls of their own age or the younger children.

The experimental results, in general, support the conceptual representation of increasing psychological maturity developed by Baldwin, Lewin, and Werner. The young children gave repeated evidence in both their over-all behavior and in their choice-making behavior of wide-spread

lack of differentiation, of inability to withstand external and internal pressures, and of limited time perspective and cognitive ability. These factors appeared to have definite consequences for choice-making behavior in the young child as contrasted with the older child.

B. Implications of the Results for Child Development Theory.

1. General Experimental Behavior.

The approach of the younger children to the entire experimental situation as compared with the older children's approach reflected what Lewin terms a lack of differentiation of social relations and areas of activities. The focus of the nursery school children was almost exclusively on the toys and the game-like qualities of the experimental procedure, with little regard for the formal aspects of the situation. They appeared to accept the experiment as just another of their many nursery school activities.

For the older children the experiment was analogous to a testing situation and consequently demanded certain kinds of behavior. First, they were aware of a difference between their role and that of the experimenter. Secondly, they were concerned with the quality of their performance in the situation, as was demonstrated by their statements about the best way to choose. A third indication of their concern with social relations was the questions they asked about the choices of other subjects of their group.

Another aspect of increasing psychological maturity displayed by the grade school group was their ability to perceive the experiment from the experimenter's point of view. They inquired about the purpose of the experiment and even passed judgment on it as with one nine-and-a-half-year-old who exclaimed, "There must be an easier way to do a thesis!" The younger children gave little indication that they regarded the experiment as anything more than a game devised for their pleasure.

Lewin believes that the boundaries between reality and unreality are much more fluid for the young child than for the older child and the adult. He defines reality as "the plane of 'facts' to which an existence independent of the individual's own wishes is ascribed. It is the realm of realistic behavior, of insuperable difficulties, etc" (17, p. 119). Unreality he describes as follows:

> A stratum of greater unreality is dynamically characterized as a softer, more fluid medium. Limits and barriers in such a stratum are less firm. The boundary between the self and the environment is also more fluid. In a plane of unreality 'one can do what he pleases' (17, p. 119).

Two aspects of the young children's behavior in the experiment appeared to be related to a limited differentiation between levels of reality and unreality. The first was the ease with which they slipped from the formal demands of the experiment into spontaneous fantasy productions suggested by the toys. The second aspect was their difficulty in adhering to the instructions to select one toy. Although there are probably several other factors involved in tendency of some of the younger subjects to grab both toys, they were transcending the limits of the situation by not making a choice. Their desire to have both toys appeared to enable them to shift into a realm where this might be possible.

2. Choice-Making Behavior.

The young children, as predicted from developmental theory, were significantly more unstable in their choices than the older children. Their limited time perspective was probably related to their lack of stability over a period of a week. The earlier prediction that the young children would be less consistent when only a few minutes intervened

between choices, since they would not perceive the two sections of the experiment as a total unit, and consequently would be more open to the influence of fluctuating needs, received support.

Although little research has been done on the problem of stability of choice behavior in young children, Vance and McCall's work presents evidence supporting these findings. Wells found that adults and children differ widely in their ability to be consistent from an expression of preference by ranking to one on the same materials by a paired comparisons technique. Her adult subjects, in contrast to the young children in this experiment, were very consistent in their choices from one situation to the next.

The lack of differentiation which appeared to be characteristic of the younger children expressed itself in their choice reactions to toys of different valences. The expressions of liking or disliking the toys were much stronger for the older children than for the younger children. The younger children appeared to react to the toys as a unit first and as individual toys second, while the older children had more distinct preferences. This difference may have been caused by the generally greater power of the toys to attract the young children. As long as the choice-objects were toys of some kind, they would perhaps have some degree of positive valence for the young children.

Another way in which limited differentiation in the young children manifested itself was a lack of sex differences in toy preferences. While the older children reacted to the toys on the basis of clearly formed conceptions of what was appropriate to their age and sex, the

younger children, as noted above, appeared to like almost all of the toys. Little boys sometimes gave the very feminine doll and the comb and mirror set quite a high preference ranking.

Sex differences in stability of preferences also appeared in the older group, but not in the younger group. The older boys were more consistant in their choices. At an earlier age boys in our culture seem to have a more definite idea of what is appropriate for them than do girls. Nine- and ten-year-old girls in the experiment displayed some interest in toy tanks, marbles, and ray guns, but the boys were very outspoken in their contempt for the girls' toys.

Lewin indicates that mental age and degree of differentiation are closely related. Results of this experiment in relation to the role of intelligence in choice-making behavior are rather tentative. But intelligence does not appear to exert an important influence on this activity when intellectually superior subjects are used.

C. Implications for Conflict Theory in Relation to Level of Psychological Maturity

The design of the experiment corresponded closely to an approach-approach situation, since, theoretically, the subjects were requested to make choices between objects of varying degrees of positive valence, or neutral valence. None of the choices were intended to cause active avoidance-avoidance reactions, as is the case, for example, in animal experiments where shock is utilized.

The major importance of taking the child's perception of the situation into account when he serves as a subject, before making predictions based on general conflict theory was demonstrated in the experiment. For the older boys certain of the least liked toys appeared to cause active avoidance tendencies, although their choices had no consequences for them.

In addition, the fact that the older children had more definite likes and dislikes regarding the toys may have influenced their behavior in the choice situation. The degree of conflict which they experienced, as measured by choice time, was greater for toys they liked least than those they liked best. In the case of the least liked toys a somewhat stable equilibrium might have been established, which according to Miller (21) would be more difficult to unbalance than the relatively unstable equilibrium created when a choice must be made between two desirable objects.

Lewin and Barker offer an explanation in terms of relative strengths of force. Barker states:

> . . .when one of the alternatives is approached closely the force opposing this resolution of the conflict decreases in strength if the alternatives are positive, whereas it increases in strength if the alternatives are negative. If the forces involved between negative and positive alternatives are of equal strengths in region X, (the region of resolving conflict) the forces in regions Xy and Xz resisting resolution will be greater than in the case of the positive alternatives, and hence, the strength of the force required to resolve the conflict will be greater for the negative than for the positive alternatives (2, p. 33).

The young children did not show a significant difference in conflict between most and least liked toys as measured by choice times. The choice situation for them probably more nearly resembled an approach-approach situation for all the toys. However, if this were the only factor operating, their choice times for all the toys should have been approximately the same as the older group's choice times on the most liked toys. The longest choice times for either group should have been the older group's time on the least liked toys. But the nursery school children were significantly slower in all their choices than the grade school children, which would indicate that the different developmental levels of the two groups are involved in the different choice times.

The hypothesis relating to speed of choice was the only major prediction not supported by the data. The original proposition stated that young children would choose faster than older children because of their inability to withhold action until they had had time to consider a situation cognitively. Qualitatively the young children did manifest a tendency to act in an impulsive fashion. A number of them seized both toys, shifted their choices, sometimes more than once, before reaching a final decision, and in other ways indicated that they were being pulled

into action by the attractiveness of the toys before they could reflect on their choices. But, as noted in the above discussion, they took significantly more time to make their choices than the older children.

One possible explanation of the younger children's slower choice times is that their reactions times are slower (15). But observations of their choice-making behavior indicated that the process of choice-making itself was often difficult for them. Subjects who grabbed both toys often had to be told more than once that they could choose only one toy, and even then it was only with reluctance they were able to reach a final decision. It appeared that it was more pleasant for them to remain in the region of indecision than to relinquish definitely the possibility of choosing both toys.

Lewin states that the region of indecision is less attractive when the conflict is between two positive valences and, along with Miller, maintains that such a choice usually should not be too difficult. In this instance, however, the children were being asked to make choices between two objects with high positive and relatively equal valences, which according to Barker (2), would mean that a relatively greater increase in the strength of one force would be necessary to resolve the conflict.

D. Methodological Considerations

One of the problems which confronted the experimenter in the early planning stages of the experiment was whether to allow the child to keep the toys of his choice or merely to have him state preferences. Barker (2) reported that conflict is less intense when the choice is hypothetical, but that the same relations hold as for a real choice. Results of this experiment, where the children stated preferences rather than chose the toys they were to keep, support Barker's findings that conflict can be produced even when the choices have no consequences for the subject.

Pilot studies with several superior three-year-olds revealed that they were unable to rank toys in the usual manner, where all the toys were kept before the subject and he was asked to arrange them in an order of preference. If the chosen toy were removed from sight after each choice, the children were able to pick from the remaining group of toys the one they liked best. The concept of an order of preference, where actual feelings of liking or disliking a specific toy are secondary to the relationship between the attractiveness of one toy and another, appeared to be a very difficult idea for the young child. Several of the nursery school group still had some difficulty making selections in the modified ranking situation, because they could not conceive of liking any single toy best in a group when they did not like any of the toys in the group at all. Their behavior in relation to the disliked toys appeared to be very much governed by their affective reactions.

Subjects in the nursery school group came, for the most part, from the families of college professors and graduate students and were markedly

superior intellectually. The grade school group came from more varied backgrounds and intelligence test scores indicated that they were not quite as superior intellectually as the younger group. Since intelligence was not a major variable under investigation, the two groups were matched only approximately for it, although care was taken that both groups fell within the same general level of intelligence and that no mental age of one group overlapped with any mental age of the other group. However, the younger group may have been closer to the grade school than test scores would indicate. Goodenough (11) points out that a difference of twenty to thirty points may occur between the mean test standings of children of day laborers and children of college professors and the difference is presumably largely a result of differences in socioeconomic levels. She also indicates research findings which show that mental test scores on children up to four or five are not very reliable as predictors of future mental status.

The present experiment can be regarded in many ways as an exploratory study of choice behavior in children. It taps only a few of the problems involved in this area and it was necessary to devise some special techniques for their study, since many of the existing methods proved unsuitable for use with pre-school children.

Certain characteristics of young children must be taken into account when planning experimental work with them. Their attention span is short, so the tasks used must not cover a very long span of time. Another result of their limited attention span is a fluctuation of interest; therefore the materials and procedures must be varied and

intrinsically interesting to the child. Young children have only limited cognitive ability and consequently the procedure must be simple enough so they can understand it without difficulty. A major problem in working with young children is that of establishing and maintaining rapport, since without it they give little or no cooperation.

E. Possibilities for Further Research

One of the important problems involved in choice behavior, and just touched on in this study, is the role of intellectual level on the ability to make choices. Results of this study are based largely on subjects of superior mental ability. But Werner cites a study by Gottschaldt (30, p. 196), who found that children from four to eight years old with retarded mentality rarely experienced a conflict between two strong motives, as normal children do. More research is needed with children of average intelligence and of below average intelligence to determine how they behave in choice situations.

Baldwin stresses the part played by the field forces of the immediate situation in determining the behavior of the young child. The barrier studies of Wright (34) and others have been related to this problem, but not with specific emphasis on the young child. Another study is needed on the influence of unit forming factors on the choice behavior of young children.

Results of the present study suggest that young children would find it very difficult to make choices between objects having a negative valence. More work in general is needed on the fundamental problem of young children's perceptions of valence.

CHAPTER VII

SUMMARY AND CONCLUSIONS

A survey of the literature reveals that children have served as subjects in a number of studies of conflict and choice behavior, but the emphasis in these experiments has been on the extension of general conflict theory rather than on the behavior of children in conflict situations. The present experiment was designed to test some deductions about children's choice behavior based on the developmental theories of Lewin, Baldwin, and Werner. These psychologists portray the young child as being relatively undifferentiated in all spheres of psychological activity, and believe that increasing differentiation occurs with increasing maturity.

The hypotheses tested in the experiment were (1) that the young child will be less stable in his choices both in an immediate situation and after an interval of time; (2) that young children will differ more from each other in their toy preferences than older children; (3) that the young child will react more rapidly to the choice materials than the older child, but that he will not act as decisively; and (4) that the young child's choices will be less influenced by differing valences of toys, as ranked by himself, than will the older child's choices.

The subjects serving in the experiment were thirty nursery school children with an average age of four years and thirty fourth grade children with an average age of nine years, ten months. Both were

intellectually superior groups. The average nursery school I.Q. was 131 and the average grade school I.Q. was 124.

The experimental procedure was divided into three parts for the young children and four parts for the older children. All phases of the experiment were conducted with each subject individually. In the first part of the experiment a modified ranking technique was used, since the younger children could not perform the regular ranking method. The child was presented with a box of ten cent toys and asked to choose the toy he liked best of all of them. The child's choice was then removed from view and he was asked to choose the toy that he liked best from the remaining toys. This procedure was followed until all the toys had been chosen. The time taken to select each toy was recorded for each subject.

In the second portion of the experiment the child was shown a series of twelve pairs of toys. Six pairs of toys were composed of the three toys the child had ranked highest and six pairs were made up of the three toys he had ranked lowest. To prevent the child from seeing the pairs of toys too soon, a cardboard screen was placed between the experimenter and the child. At a signal of "ready" from the experimenter, the screen was lifted to reveal the toy and the child made his choice. The time taken to make a choice from the instant of exposure to the child's final indication of choice was used as the measure of conflict.

The third part of the experiment consisted of having the children rank the toys again after an interval of approximately a week. This

concluded the experiment for the younger children, but the older children were interviewed to obtain additional information about the attractiveness of the toys for them.

The experimental data were analyzed with non-parametric statistics because they failed to meet the assumptions necessary for the use of normal probability statistics. Raw data obtained from the experiment included ranking times for the first and second ranking situations, total choice times and choice times for the best and least liked toys, and orders of toy preferences for the first and second rankings. Frequency distributions of the time scores for many of the subjects were very skewed, so the median times for each subject was used as his score rather than mean times. The two sets of rankings for each child were converted into single rank order correlations, which then served as measures of stability for each subject.

The following conclusions were drawn from the results:

1. Young children are less consistent in their choices both in an immediate situation and after an interval of time.

2. Young children differ more from each other in their preferences than grade school children.

3. Young children choose more rapidly than older children when given a whole array of toys to choose from, but less rapidly than older children when the task is to select between two toys.

4. The behavior of young children in a choice situation is more indecisive than older children's behavior.

5. The choice behavior of young children is not influenced by the valence of the toys, as ranked by themselves, but older children find it more difficult to make choices between toys they dislike.

6. Fourth grade boys agree more as a group in their preferences than girls of their age or nursery school children.

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APPENDIX

TABLE XVI

SEX, I.Q.'S, AND AGES OF INDIVIDUAL NURSERY SCHOOL SUBJECTS

Subject Number	Sex	I.Q.	Age
1	Girl	152	3-4-10
2	Boy	150	5-1-2
3	Girl	150	3-6-10
4	Girl	150	4-8-9
5	Girl	150	5-3-11
6	Girl	146	4-4-10
7	Boy	141	5-4-0
8	Boy	138	4-10-11
9	Girl	138	4-2-9
10	Boy	137	4-8-2
11	Boy	136	3-10-1
12	Girl	136	3-9
13	Girl	132	3-0-0
14	Girl	132	4-10-4
15	Girl	131	4-4-15
16	Boy	131	3-9-18
17	Girl	130	4-10-28
18	Boy	128	3-11-0
19	Boy	124	4-7-21
20	Boy	123	4-9
21	Girl	122	4-5-15
22	Girl	122	4-2-0
23	Boy	122	4-1-1
24	Boy	119	4-4-0
25	Girl	118	5-2-2
26	Boy	113	4-6-4
27	Girl	113	5-2-5
28	Boy	109	4-11-0
29	Girl	108	5-1-10
30	Boy		3-9-12

TABLE XVII

SEX, I.Q.'S, AND AGES OF INDIVIDUAL GRADE SCHOOL SUBJECTS

Subject Number	Sex	I.Q.	Age
31	Girl	151*	9-9-13
32	Girl	141	9-7-13
33	Boy	141*	10-0-6
34	Boy	144*	9-9-27
35	Girl	139	10-4-11
36	Girl	138	10-1-5
37	Boy	138	10-0-11
38	Girl	131*	9-7-20
39	Boy	130	9-11-26
40	Girl	126	9-10-26
41	Boy	126*	10-0-22
42	Boy	116*	10-2-17
43	Boy	125	9-11-22
44	Girl	124*	9-9-17
45	Boy	124	9-8-15
46	Girl	123*	9-10-15
47	Girl	122*	9-8-10
48	Girl	122*	9-9-27
49	Boy	120	9-4-22
50	Girl	118*	9-9-1
51	Boy	116*	10-0-7
52	Boy	116	9-4-23
53	Boy	116	9-6-7
54	Boy	116*	10-2-17
55	Girl	115*	9-11-7
56	Boy	111	10-3-3
57	Boy	114*	9-5-15
58	Boy	110	10-2-16
59	Girl	110*	9-10-9
60	Girl	103*	9-3-8

*Tested with short form of California Mental Maturities Test—Elementary Scale.

TABLE XVIII

INDIVIDUAL RANK ORDER CORRELATIONS
FOR NURSERY SCHOOL AND
GRADE SCHOOL SUBJECTS

Nursery School		Grade School	
Subjects	Rhos	Subjects	Rhos
1	.62	31	.84
2	.49	32	.82
3	.17	33	.93
4	.55	34	.92
5		35	.64
6	.16	36	
7	.66	37	.78
8	.82	38	.92
9	.18	39	.94
10		40	.86
11	.28	41	.96
12	.68	42	.76
13	.62	43	.98
14	-.04	44	.72
15	.40	45	.95
16		46	.91
17	.72	47	.58
18	.22	48	.93
19	.06	49	.28
20	.78	50	.45
21	.80	51	.84
22	.54	52	.88
23		53	.90
24	.70	54	.84
25	-.16	55	.77
26	.58	56	.66
27	-.14	57	.82
28	.74	58	.96
29	.06	59	.68
30	.16	60	.60

TABLE XIX

INDIVIDUAL CHOICE TIME MEDIANS IN SECONDS
FOR NURSERY SCHOOL SUBJECTS ON
MOST LIKED TOYS, LEAST LIKED TOYS
AND TOTAL CHOICE TIMES

Subject	Most Liked	Least Liked	Total
1	4.25	4.25	4.25
2	10.00	8.75	9.00
3	2.25	2.75	2.5
4	5.75	5.25	5.5
5	4.00	3.75	3.25
6	5.00	4.00	4.00
7	4.5	4.75	4.5
8	12.00	3.50	6.5
9	2.25	1.75	2.
10	2.5	1.5	1.75
11	4.00	4.25	4.25
12	7.25	7.25	7.25
13	2.25	3.25	2.5
14	2.5	2.00	2.00
15	3.25	4.25	4.00
16	2.75	2.75	2.75
17	2.5	2.5	2.5
18	3.5	3.5	3.5
19	3.00	3.00	3.00
20	4.5	3.	4.5
21	8.75	10.25	9.25
22	2.75	2.5	2.5
23	3.00	3.25	3.25
24	3.00	3.25	3.00
25	3.75	4.	4.00
26	2.5	4.	3.25
27	2.5	3.25	2.75
28	2.5	7.75	4.5
29	2.5	2.75	2.5
30	3.00	3.25	3.00

TABLE XX

INDIVIDUAL CHOICE TIME MEDIANS IN SECONDS FOR GRADE SCHOOL SUBJECTS ON MOST LIKED TOYS, LEAST LIKED TOYS AND TOTAL CHOICE TIMES

Subjects	Most Liked	Least Liked	Total
31	1.5	1.5	1.5
32	2.00	2.25	2.00
33	2.25	1.00	1.5
34	1.5	1.5	1.5
35	1.75	2.00	2.00
36	3.00	3.25	3.00
37	1.00	1.75	1.25
38	2.5	3.00	2.5
39	1.5	1.75	1.5
40	1.00	1.5	1.25
41	2.00	2.00	2.00
42	2.25	2.25	2.25
43	1.75	2.00	2.00
44	2.50	3.75	3.25
45	1.25	1.5	1.5
46	3.00	5.00	4.25
47	1.50	1.5	1.5
48	2.00	2.75	2.5
49	1.5	1.75	1.5
50	1.5	2.00	1.75
51	1.5	1.5	1.5
52	1.75	1.5	1.5
53	2.00	2.	2.
54	1.5	1.5	1.5
55	2.5	2.5	2.5
56	2.00	2.00	2.00
57	1.25	1.75	1.75
58	2.25	2.25	2.25
59	.75	1.00	1.00
60	2.00	2.00	2.00

TABLE XXI

FIRST AND SECOND RANKING TIME
MEDIANS IN SECONDS FOR INDIVIDUAL NURSERY
SCHOOL SUBJECTS

Subject	First	Second
1	3	1 1/2
2	7 3/4	4
3	2	2
4	2	2
5	1 1/2	——
6	3	3 1/2
7	3	2 1/2
8	1	2
9	1 1/2	1
10	1	——
11	2 1/2	4
12	2	1 1/2
13	2 1/2	1 1/2
14	2 1/2	1 1/2
15	1 1/2	1
16	3	——
17	2 1/2	2
18	2	2 1/2
19	1 1/2	1 1/2
20	4 1/2	3
21	4 1/2	4 1/2
22	3	2
23	2 1/2	——
24	2 1/2	2
25	2	3 1/2
26	1	1
27	1	1 1/2
28	2	2 1/2
29	1 1/2	1
30	1 1/2	1

TABLE XXII

FIRST AND SECOND RANKING TIME MEDIANS IN SECONDS FOR INDIVIDUAL GRADE SCHOOL SUBJECTS

Subject	First	Second
31	2	1 1/2
32	2	1
33	5	1 1/2
34	2	1
35	2 1/2	1 1/2
36	3 1/2	———
37	1 1/2	1
38	3 1/2	2
39	2	2 1/2
40	3	2
41	5	2 1/2
42	3 1/2	4
43	2	2
44	3 1/2	2
45	3	3
46	9 1/2	5
47	1 1/2	1
48	3	2
49	2	1 1/2
50	2	1
51	5	2
52	5 1/2	1
53	3	2 1/2
54	4 1/2	3 1/2
55	5	2
56	6 1/2	4 1/2
57	2	1 1/2
58	5 1/2	2
59	1 1/2	1/2
60	2 1/2	2

TABLE XXIII

FREQUENCIES OF INDIVIDUAL PAIRED COMPARISONS
CHOICES OF TOYS RANKED HIGHER OR
LOWER IN THE RANKING SITUATION
BY NURSERY SCHOOL SUBJECTS

Subject	Ranking Position	Most Liked	Least Liked	Total
1	Higher	2	2	4
	Lower	4	4	8
2	Higher	4	2	6
	Lower	2	4	6
3	Higher	6	1	7
	Lower	0	5	5
4	Higher	2	4	6
	Lower	4	2	6
5	Higher	4	6	10
	Lower	2	0	2
6	Higher	2	5	7
	Lower	4	1	5
7	Higher	4	5	9
	Lower	2	1	3
8	Higher	4	3	7
	Lower	2	3	5
9	Higher	4	5	9
	Lower	2	1	3
10	Higher	5	4	9
	Lower	1	2	3
11	Higher	3	5	8
	Lower	3	1	4
12	Higher	5	4	9
	Lower	1	2	3
13	Higher	2	2	4
	Lower	4	4	8

TABLE XXIII, CONTINUED

Subject	Ranking Position	Most Liked	Least Liked	Total
14	Higher	3	4	7
	Lower	3	2	5
15	Higher	5	5	10
	Lower	1	1	2
16	Higher	4	6	10
	Lower	2	0	2
17	Higher	3	2	5
	Lower	3	4	7
18	Higher	4	3	7
	Lower	2	3	5
19	Higher	4	4	8
	Lower	2	2	4
20	Higher	5	3	8
	Lower	1	3	4
21	Higher	4	4	8
	Lower	2	2	4
22	Higher	3	5	8
	Lower	3	1	4
23	Higher	4	4	8
	Lower	2	2	4
24	Higher	5	3	8
	Lower	1	3	4
25	Higher	3	3	6
	Lower	3	3	6
26	Higher	5	4	9
	Lower	1	2	3
27	Higher	4	4	8
	Lower	2	2	4
28	Higher	3	5	8
	Lower	3	1	4

TABLE XXIII, CONTINUED

Subjects	Ranking Position	Most Liked	Least Liked	Total
29	Higher	2	3	5
	Lower	4	3	7
30	Higher	1	3	4
	Lower	5	3	8

TABLE XXIV

FREQUENCIES OF INDIVIDUAL PAIRED COMPARISONS
CHOICES OF TOYS RANKED HIGHER OR
LOWER IN THE RANKING SITUATION
BY GRADE SCHOOL SUBJECTS

Subject	Ranking Position	Most Liked	Least Liked	Total
31	Higher	6	5	11
	Lower	0	1	1
32	Higher	4	3	7
	Lower	2	3	5
33	Higher	1	6	7
	Lower	5	0	5
34	Higher	6	6	12
	Lower	0	0	0
35	Higher	6	4	10
	Lower	0	2	2
36	Higher	6	4	10
	Lower	0	2	2
37	Higher	5	4	9
	Lower	1	2	3
38	Higher	6	5	11
	Lower	0	1	1
39	Higher	6	4	10
	Lower	0	2	2
40	Higher	2	4	6
	Lower	4	2	6
41	Higher	6	6	12
	Lower	0	0	0
42	Higher	6	6	12
	Lower	0	0	0
43	Higher	6	6	12
	Lower	0	0	0

TABLE XXIV, CONTINUED

Subject	Ranking Position	Most Liked	Least Liked	Total
44	Higher	6	5	11
	Lower	0	1	1
45	Higher	5	4	9
	Lower	1	2	3
46	Higher	5	5	10
	Lower	1	1	2
47	Higher	4	3	7
	Lower	2	3	5
48	Higher	4	3	7
	Lower	2	3	5
49	Higher	2	5	7
	Lower	4	1	5
50	Higher	3	2	5
	Lower	3	4	7
51	Higher	6	6	12
	Lower	0	0	0
52	Higher	3	5	8
	Lower	3	1	4
53	Higher	6	6	12
	Lower	0	0	0
54	Higher	4	6	10
	Lower	2	0	2
55	Higher	2	4	6
	Lower	4	2	6
56	Higher	6	6	12
	Lower	0	0	0
57	Higher	4	6	10
	Lower	2	0	2
58	Higher	3	6	9
	Lower	3	0	3

TABLE XXIV, CONTINUED

Subject	Ranking Position	Most Liked	Least Liked	Total
59	Higher	4	2	6
	Lower	2	4	6
60	Higher	5	6	11
	Lower	1	0	1