

AN EXPLORATORY STUDY OF THE MONETARY
CONCEPTS OF PRESCHOOL CHILDREN

By

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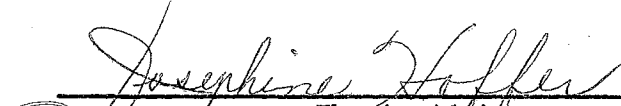
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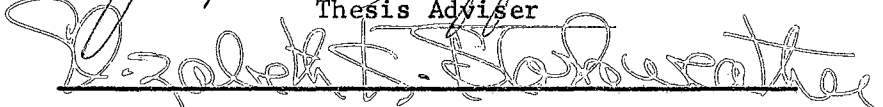
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TABLE OF CONTENTS

| Chapter | Page |
|---|------|
| I. THE PROBLEM | 1 |
| Purpose. | 3 |
| II. REVIEW OF LITERATURE. | 4 |
| Definition of a Concept. | 4 |
| Development of Concepts. | 6 |
| Development of Monetary Concepts. | 6 |
| Young Children's Knowledge of and Experience | |
| With Money | 7 |
| The Need for Consumer Experiences During Preschool | |
| Years. | 9 |
| Implications for the Present Study | 10 |
| III. METHOD AND PROCEDURE. | 11 |
| Development of the Instrument. | 11 |
| Sorting Money and Non-money Items - Test I. | 12 |
| Identification of Coins - Test II. | 13 |
| Comparative Value of Coins - Test III | 14 |
| Equivalent Value of Coins - Test IV | 15 |
| The Revised Instrument. | 17 |
| Subjects Selected. | 17 |
| IV. ANALYSIS OF DATA. | 19 |
| The Ability to Identify Coins as Money | 19 |
| The Ability to Identify Coins by Name. | 21 |
| Knowledge of Comparative Value | 22 |
| Knowledge of Equivalent Value. | 25 |
| Summary. | 26 |
| Findings. | 26 |
| Observations by Investigator. | 26 |
| V. SUMMARY AND RECOMMENDATIONS | 28 |
| Findings | 28 |
| Observations by Investigator | 29 |
| Recommendations for Further Research | 29 |
| A SELECTED BIBLIOGRAPHY. | 31 |

| Chapter | Page |
|----------------------|------|
| APPENDIX A | 34 |
| APPENDIX B | 37 |

LIST OF TABLES

| Table | Page |
|---|------|
| I. Age Distribution of the Subjects | 18 |
| II. Frequency of Correct Responses of Preschool Children on a Money-Sorting Task, by Age Groups. | 20 |
| III. Frequency and Percent of Correct Responses of Preschool Children on a Money-Identification Task, by Age Groups | 22 |
| IV. Frequency and Percent of Correct Responses of Preschool Children on a Comparative Value Task, by Age Groups. . . | 24 |
| V. Frequency of Correct and Incorrect Responses of Preschool Children on an Equivalent Value Task | 26 |
| VI. Frequency of Correct Responses of Individual Children of the Tasks Designed to Measure Money Concepts of Preschool Children | 35 |

LIST OF FIGURES

| Figure | Page |
|--|------|
| 1. Percent of Children in Three Age Groups Responding Correctly in a Coin-Identification Task. | 23 |

CHAPTER I

THE PROBLEM

This study is concerned with the monetary concepts of preschool children. Helping children learn the consumer role at an early age is a unique characteristic of modern society in the United States. McNeal (1964) found that children are actively involved in the consumer process by five years of age. This involvement suggests that children should
2. (gain a knowledge of the basic principles of our monetary system during the preschool years.)

Limited research has been conducted on the preschool child's understanding of money. Marshall and Magruder (1960) found that the preschool child's monetary concept development lags somewhat because of the lack of meaningful experiences. Robison (1964) found that such meaningful experiences could be provided in a preschool situation.

Gordon, Gordon and Gunther (1946) have stated that children of this generation are more concerned with money and material goods than children of the past generation for the following reasons: (1) they receive an allowance earlier, usually as early as five; (2) they are encouraged by parents to participate in a consumer role at an earlier age; (3) merchants and advertisers appeal directly to children to buy thousands of brands and types of goods; (4) they are the object of much spending by adults; and (5) they are constantly subjected to the materialistic displays of other children.

McNeal (1964) indicates that children may be more active as primary consumers in the future than today's children, since the trend toward permissiveness in child rearing may indicate that there will be a greater independency of children's spending. Not only are children more independent spenders than formerly; but, the census bureau estimates that there will be a marked increase in the number of spenders. This potential for expenditure, combined with the increased desire of children to spend money, would indicate that there is an increasing necessity for effective methods of helping children learn the concepts of money management.

Recommendations on how to help children learn about money have been in current child development texts, money management texts and bulletins; however, investigation of such literature indicates that very little research has been conducted by which to substantiate such recommendations.

Most research concerning experience with monetary concepts and attitudes has been done with children six years and older. Little is known about the processes of preschool children's monetary conceptual development; however, there is evidence that the preschool child definitely is becoming involved with receiving and spending money at this early age.

Parents and educators should be concerned with providing those experiences which result in the most effective kind of learning. In order to provide effective and timely learning experiences, it is necessary to determine what understandings are present and what misconceptions are present at various points in the development of monetary concepts in young children.

Purpose

The purpose of this study is to investigate the preschool child's ability to exhibit the following monetary skills: (1) the ability to differentiate coins as money, (2) the ability to identify coins by name, (3) the ability to identify the value of the coin. The findings of this study should help identify the errors in monetary conceptual development which may be commonly made by the preschool child and the learnings which he may be expected to achieve at a given age level. In addition, the findings may provide a basis for helping teachers and parents provide meaningful learning experiences related to the child's use of money.

CHAPTER II

REVIEW OF LITERATURE

In this chapter will be discussed the literature related to the preschool child's development of monetary concepts. This will include four sections: (1) Definition of a Concept; (2) Development of Concepts, including Development of Monetary Concepts; (3) Young Children's Knowledge of and Experience With Money; and (4) Implications for the Present Study.

A survey of literature on concept development reveals a lack of complete agreement among authors on (1) the definition of a concept and (2) the development of a concept.

Definition of a Concept

Smoke (1935) explained concept formation in terms of stimulus and response. He defined a concept as "a kind of selective system in the mental organization of a person which links previous experience and current states with stimulus objects"; and he defined concept formation as "a process whereby an organism develops a symbolic response which is made to the members of a class of stimulus patterns but not to other stimuli." (Smoke, p. 278-9)

In line with this definition, the standard by which one can judge whether a concept has been learned or not is the consistency with which

he is able to make a symbolic response that differentiates the members of the class in a stimulus pattern from stimuli which are regarded as falling outside that class.

Vinacke (1952) objected to this self-contained definition of a concept. He stated that the area of concept formation was more encompassing than that contained in the definition by Smoke. He attempted to combine the findings of several researchers (Smoke, 1932; Hull, 1920; Hayakawa, 1941; Reed, 1946; and Welsh, 1940), in order to clarify the meaning of a concept and he came to the following conclusions:

1. Concepts depend on the previous experience of the organism. They are not direct sensory data but something resulting from elaboration and combination. The subject cannot respond in a specified manner without data derived from previous experience.

2. Concepts are systems within the mental organization which tie together or combine discrete sensory experiences. A word can tie together different objects somewhat related to each other, as well as the emotions aroused during these experiences.

3. The same concept may be evoked by a variety of stimuli. An external stimulus may arouse a symbolic response or a symbolic response may guide internal perceptual activity.

4. Concepts have both extensional (denotative) and intensional (connotative) meaning. The extensional aspects correspond to the objective properties of the stimulus object as far as they can be identified by the perceiver. The intensional aspects are those that are suggested by one's mind or which are derived from an individual's unique experiences.

5. Concepts vary in the consistency or correctness of their organization.

Development of Concepts

There is considerable discussion in literature concerning whether a child learns a concept in stages or in a continuum. Jean Piaget (1930) has defined various stages of concept development; and other researchers (e.g., Annett, 1959; Curti, 1950; Durkin, 1959) have supported his point of view. Those who believe that concepts develop in a continuum (e.g., Humphrey, 1951; Wann, Dorn and Liddle, 1962; Wenzel and Flurry, 1948) believe that no definite stages can be defined. Although researchers differ on the process of conceptual development, they do seem to agree that there is some orderliness to the development of concepts. In all cases, the child makes systematic mistakes before he is able to form an accurate or consistent concept. The study of such mistakes is necessary in tracing the development of concepts.

Development of Monetary Concepts

Limited research has been conducted to determine what monetary concepts one might expect a preschool child to possess. Robison (1964) tested the preschool child's ability to identify six denominations of money. The subjects in her study were 25 children of a high socioeconomic level. Only four children in this group could identify all six pieces of money, and four other children could identify five out of the six.

Strauss and Schuessler (1951) found that children as young as three years of age could distinguish between money and other objects such as

buttons. Between coins, the maximum distinction they could make was between a penny and something else not a penny. They could not consistently match pairs of coins; and if asked which of two coins they would rather have, they chose the one of greater value only by chance, or because greater size happened to correspond to greater value. These children did not connect money with the buying process. However, somewhat older children related a penny to the buying process, but denied that any other coins had anything to do with buying.

Strauss and Schuessler (1951) also found that older children (4 years, 8 months to 5 years, 11 months) understood that money had to do with buying; however, they did not understand that the value of the coin was related to the cost of the purchase. The children in this group could distinguish nickels from other silver, but could not name the other coins correctly. The child's preferences for coins were based upon rote memory or upon the size of the coin rather than its value. Not until six years of age could the children correctly name all of the coins and show an understanding of their comparative value.

Young Children's Knowledge of and Experience

With Money

The experiences which children have with money during their formative years seems to be related to their ability to assume financial responsibility in adult life. Preevey (1945) in her quantitative study of family practices in training children in the use of money found a direct relationship between children's early practice in the use of money and their ability to manage money wisely in later life.

Money becomes meaningful to the child only when he has an opportunity to use it. Many authors (e.g., Greunberg and Gruenberg, 1933; Marshall and Magruder, 1960; Andrew, 1932; Kirkpatrick, 1915; Ojeman, 1933) have stressed the educational value of supplying children with money which they can manage. Children's early experiences with money provide them with opportunities to accept the responsibility of planning and making choices and decisions which are similar to the financial problems encountered in adult life. Hanson (1933), in a study of children's use of money, concluded that receiving money according to a well defined plan with parental guidance was more favorable to child development than haphazard methods.

Marshall and Magruder (1960) were concerned with the effects of various money education practices on the child's knowledge and use of money. From the bulletins and texts distributed to parents and educators, they compiled recommendations about effective methods of teaching monetary concepts to children. Of these recommendations, four were supported by the Marshall and Magruder study. They were as follows:

(1) If children are given wide experience in the use of money, they will have more knowledge of money and its use than will children lacking such experience. (2) Children will have more knowledge of the use of money if they are given money to spend. (3) Children will have more knowledge of and experience with money if their parents handle the family income wisely. Insofar as allowances are concerned, children who received allowances seemed to have no greater knowledge of money than those who did not.

The Need for Consumer Experiences

During Preschool Years

McNeal (1964) stated that the trend toward permissiveness in child-rearing suggests that in the future there may be a greater independency of children's spending; and that children may become more active as consumers at an earlier age. He found that children five years old were significantly involved in the consumption process and that many of them were receiving some kind of allowance.

Marshall and Magruder (1960) found that the development of money concepts during the preschool years lags behind that of other concepts because of the lack of meaningful experiences. Robison (1964) explored the possibilities of providing such meaningful experiences in a pre-school program.

Children start school with a wide range of concepts about money, from vague, confused ideas to some rather sophisticated understandings. The kindergarten can provide children with experiences and materials which encourage the discovery and development of concepts about money. (Robison, 1964, p. 74)

Robison used a planned training program to teach preschool children approved money concepts.

Free play activities were featured for this kindergarten class for discovery of meaning, supplemented by various teaching methods including individual teacher interaction, "Guided Manipulation," realistic types of experiences and group discussion. "Guided Manipulation" involved chiefly lotto-type games with coins designed to focus on their similarities and differences. (Robison, 1964, p. 73)

Robison's findings indicate that the rather unstructured, yet planned, learning experiences of this kindergarten were effective in improving the children's monetary concepts.

Piaget (1930) states that conceptual learnings are spontaneous, independent findings of the child; and the findings of Robison (1964)

indicate that a preschool situation could provide excellent opportunities for such independent learning.

Implications for the Present Study

The following points from the literature have significance for the present study: (1) concepts develop in a sequential order with a number of characteristic errors; (2) the development of adequate monetary concepts is dependent upon an exposure to adequate educational experiences concerning money; (3) children's early experience with money affect their later ability to manage money; (4) educational experiences for the development of monetary concepts could be provided in a preschool setting; however, there is a need for research to determine the levels of ability and the characteristic errors of the preschool child.

CHAPTER III

METHOD AND PROCEDURE

The purpose of the study is to investigate the preschool child's ability to identify coins as money, ability to identify coins by name, and his ability to identify the value of coins.

To achieve the foregoing purpose, (1) an instrument composed of four tests was developed, (2) the subjects were selected and divided into three age groups, (3) the tests to measure the various skills were administered to the subjects and (4) the responses of the subjects were compared by age groups to reveal errors in concept development which may commonly be made by the preschool child and to reveal learnings which he may possess at a given age level.

Development of the Instrument

Prior to the actual research, the investigator observed children spending money in stores and interacting in "store dramatic play" situations in the nursery school. Parents and children were interviewed in an informal way to further the investigator's knowledge of children's experience with money, their money vocabulary and their understandings.

After informal observation and interviews, the investigator designed four tests to measure a child's knowledge of money concepts. As a pilot study, these tests were administered to nine children ranging in age from three years and five months to five years and ten months.

The children's verbal and manual responses were recorded. The term "manual response" refers to any physical action such as picking up the coin, or feeling the coin.

Sorting of Money and Non-money Items - Test I

The purpose of this test is to measure the child's ability to identify coins as money.

Pilot study. Several money and non-money items were placed on a table before the child. The money items included a penny, a nickel, a dime, a quarter, and a half-dollar. The non-money items included a bus token, a foreign coin, a bracelet charm, a button, three pieces of plastic play money, two pieces of tin play money, and a poker chip.

The child was given an opportunity to explore the money and non-money items. The investigator then instructed the child to separate the money from the non-money items by saying, "Show me the money you could use to buy things at the store. You may put the money you would take to the store over here." (The investigator indicated a spot for placement of the money items.) The investigator then allowed the child to sort the money and non-money items. The child's verbal and manual responses were recorded.

Revisions. An evaluation of the children's responses to the money and non-money sorting test indicated that the length of time required to sort all of the items was beyond the attention span of most of the subjects. To reduce the required time, several items were eliminated. The button and the poker chip, readily sorted by all the children, and the foreign coin, missed by all the children, were eliminated.

Some of the children commented that they could "pretend buy" with the non-money items and put these items with the money items. To eliminate this problem, the investigator changed the verbal instructions. Pointing to the right side of the table the investigator said, "You may put the real pieces of money for a real store over here." She then pointed to the left side of the table and said, "You may put the 'pretend pieces' for a 'pretend store' over here."

The investigator also found that the children's attention was immediately attracted by the money and non-money items when they entered the testing situation, and that it was difficult to maintain their attention long enough to give adequate directions. To eliminate this problem, the money and non-money items were removed from a small plastic purse as the directions were being given.

The revisions that were made during this step of the pilot study were (1) shortening the required time by eliminating three items, (2) clarifying the instructions, and (3) providing an atmosphere which was less distracting for giving the instructions.

Identification of Coins - Test II

The purpose of this test was to investigate the child's ability to identify coins by name.

Pilot study. A penny, a nickel, a dime, a quarter and a half-dollar were placed on a small table before the child. The child was instructed to identify the coins by responding to, "Put your finger on the (dime)." Each coin was named in a like manner. When the child had completed identifying or attempting to identify all the coins, the investigator again presented each coin by moving it to the center of the

table and asking, "What do you call this?" The responses of the children were recorded.

Revisions. An examination of the responses revealed that three of the children had named the coins by giving their value, e.g., a dime was called "ten cents." These same children incorrectly pointed to some of the coins when the name of the coin was given. This suggested that the child should be given an opportunity to identify the coins by name, e.g., a dime, and by value, e.g., ten cents. This use of the term "ten cents" was another way of naming the coins and not an indication that the child understood the value.

The possibility that a correct response could be given by chance suggested that the investigator ask the child to respond to each coin twice by name and twice by value.

The revisions that were made during this step of the pilot study were (1) an extension of the test to include identification of the coins by value as well as by name and (2) the addition of a second series of responses.

Comparative Value of Coins - Test III

The purpose of this test is to measure the child's knowledge of comparative value of coins.

Pilot study. The penny, nickel, dime, quarter and half-dollar were paired in all possible combinations. The pairs were placed on the table in front of the child, one at a time. As each pair was presented, the investigator asked, "Which piece of money would you rather take to the store? Show me the one you would rather have." Each time the child

chose the coin of lesser value, the investigator asked, "Why do you like that one best?" The child's choice and verbal comments were recorded.

Revisions. Many children indicated a preference for a coin because it bought a particular object. Others commented that they had chosen the coin because it was "more." In order to elicit a response that was based on an understanding of the value of the coin, the investigator rephrased her question to state, "Which piece of money would buy the most candy at the store?"

Some children's choices were influenced by the position of the coin rather than by an understanding of its value. These children always chose the coin on the right (left). To eliminate this problem, the investigator presented each pair of coins twice with the coin of greater value appearing once on the left and once on the right.

In order to provide for more efficient and rapid presentation of the test, the investigator glued the paired coins on note cards.

The revisions that were made during this step of the pilot study were (1) a change in the instructions so that value was clearly indicated, and (2) a change in the arrangement of the paired coins and the length of the test in order to prevent the child's score from being influenced by the position of the coin.

Equivalent Value of Coins - Test IV

The purpose of this test is to measure the child's knowledge of equivalent value of coins.

Pilot study. The investigator selected a number of small inexpensive toys. The toys were arranged on a structure of four shelves. Each

shelf was painted a different color and had a coin glued on the right hand corner to indicate the price of the toys on that shelf. The prices were five, ten, twenty-five and fifty cents.

The child was seated at a table with the shelves to his right so that he could see the coin clearly. On the table before the child, the following coins were placed; three quarters, six dimes, seven nickels, and twelve pennies. The child was asked to choose one toy from the selection on the top shelf. The investigator then pointed to the coin on that shelf (a nickel) and said, "That (toy) costs this much." The investigator then pointed to the money on the table and said, "You may buy this (toy) with this money. Give me the pieces of money you could use to buy it."

The same procedure was followed for the other three shelves on which the toys were priced at ten, twenty-five and fifty cents respectively.

Revisions. The children tended to choose the same coin as that glued to the shelf rather than matching it with coins of equivalent value. To eliminate this problem, the coins to be used for matching were contained in separate purses. Seven pennies and one dime were used for matching the nickel; three nickels and eleven pennies were used for matching the dime; five nickels, three dimes and a half-dollar were used for matching the quarter; and three quarters, seven dimes, six nickels and a penny were used for matching the half-dollar. The number of toys also seemed distracting for the child. To eliminate this problem, the investigator showed the child four toys and asked him to choose one. The toy chosen by the child was then placed on the top shelf and the others were removed from sight. The investigator

then moved this toy from one shelf to the next during the test, and as she did so said, "Let's pretend that the (toy) costs this much. You may buy it with the money in this purse." Simultaneously, she gave the child the purse which contained the money for matching the coin on that particular shelf.

The revisions that were made during this step of the pilot study were (1) a division of the coins so that those for use with each shelf were in separate purses; and (2) a change in the presentation of the toys, so that the child chose one toy which was then used for all four "purchases."

The Revised Instrument

The final instrument consisted of four tests revised as described above. In order to determine if the revisions were adequate, the tests were administered to seven subjects ranging in age from four years and five months to five years and eleven months. In this last step of the pilot study, the four tests seemed to differentiate between the children who possessed the knowledge necessary to exhibit each of the skills and those who did not.

A detailed description of the four revised tests and the score sheets are given in Appendix B.

Subjects Selected

The final subjects selected for the study were fifty children, boys and girls, ranging in age from four years to five years and six months. The subjects were divided into three age groups. The age distribution in each group is shown in Table I.

TABLE I
AGE DISTRIBUTION OF THE SUBJECTS

| | Number | Age [*] |
|-----------|--------|------------------|
| Group I | 22 | 5-1 to 5-6 |
| Group II | 15 | 4-6 to 5-0 |
| Group III | 13 | 4-0 to 4-5 |

* Age is expressed in years and months

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to investigate the preschool child's ability to identify coins as money, to identify coins by name, and to identify their value. Four tests were devised to measure the foregoing skills. Specifically, these tests measured (1) the child's ability to identify coins as money, (2) the child's ability to identify coins by name, (3) the child's knowledge of the comparative value of coins and (4) the child's knowledge of the equivalent value of coins. These four tests were administered to fifty preschool children representing three age groups; Group I, 5-1 to 5-6; Group II, 4-6 to 5-0; and Group III, 4-0 to 4-5.

The Ability to Identify Coins as Money

The sorting task, Test I, measured the children's ability to differentiate between money and non-money objects. In Table II, the frequency and percentage of correct responses are presented for the three age groups.

A chi-square analysis indicated that the older children made significantly more correct responses than did the younger children.

(Chi-square = 26.68, $p < .001$)

Some of the non-money objects were more easily identified by the children than were others. This was particularly true for the younger

children, those in Groups II and III.

TABLE II
FREQUENCY OF CORRECT RESPONSES OF PRESCHOOL CHILDREN
ON A MONEY-SORTING TASK, BY AGE GROUPS
(N = 50)

| | Group I (N 22) 5-1 to 5-6 * | Group II (N 15) 4-6 to 5-0 | Group III (N 13) 4-0 to 4-5 |
|---------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| Money Items | | | |
| Half-dollar | 20 | 14 | 09 |
| Quarter | 20 | 14 | 10 |
| Dime | 21 | 13 | 08 |
| Nickel | 20 | 13 | 10 |
| Penny | 21 | 15 | 12 |
| Non-money Items | | | |
| Plastic Half-dollar | 21 | 13 | 11 |
| Bracelet Charm | 10 | 03 | 01 |
| Plastic Dime | 19 | 13 | 08 |
| Tin Dime | 18 | 11 | 08 |
| Bus Token | 20 | 10 | 06 |
| Plastic Penny | 19 | 14 | 09 |
| Total | 209 | 133 | 92 |
| Percentage of Correct Responses | 86% | 81% | 64% |

* Ages are expressed in years and months

The bracelet charm, which resembled a coin, and the bus token were incorrectly identified most frequently. The children in all three groups made fewer mistakes in sorting the money items than in sorting the non-money items.

In the sorting task, the children seemed to use four means of distinguishing money and non-money items. (1) They dropped the items on the table and listened to the sound. (2) They looked for serrated edges on the coins. (3) They looked for faces on the surface of the coins. (4) They examined the material out of which the coins and the non-money objects were made. Neither the sequence in which the coins were sorted nor the physical responses of the children were recorded; however, an examination of the money and non-money objects most frequently missed by the children might give an indication of the characteristics which are most apt to confuse young children.

The Ability to Identify Coins by Name

The identification task, Test II, measured the children's ability to identify coins by name. Inasmuch as some children knew coins by their value (whether or not they understood the value) this task provided an opportunity for identification by name (e.g., penny, nickel) and by value (e.g., one cent, five cents). Children were credited with identifying the coin correctly if they did so by either method.

The frequency and percent of correct responses for each coin by age groups is presented in Table III. Analysis of these data indicated that the coins of smaller denomination were more frequently identified than were the coins of larger denomination (chi-square = 20.08; $p < .001$).

Also, the older children correctly identified more coins than did the younger children (chi-square = 26.02; $p < .001$). These differences in the children's ability to identify coins are illustrated by the bar graph in Figure 1.

TABLE III
FREQUENCY AND PERCENT OF CORRECT RESPONSES OF PRESCHOOL
CHILDREN ON A MONEY-IDENTIFICATION TASK,
BY AGE GROUPS
(N = 50)

| Coin | Group I (N 22) 5-1 to 5-6* | | Group II (N 15) 4-6 to 5-0 | | Group III (N 13) 4-0 to 4-5 | |
|---------------------------|----------------------------------|-----|----------------------------------|----|-----------------------------------|----|
| | N | % | N | % | N | % |
| | | | | | | |
| Half-dollar (50 cents) | 7 | 32 | 5 | 33 | 0 | 00 |
| Quarter (25 cents) | 10 | 90 | 9 | 60 | 2 | 15 |
| Dime (10 cents) | 16 | 73 | 9 | 60 | 4 | 31 |
| Nickel (5 cents) | 13 | 59 | 10 | 67 | 4 | 31 |
| Penny (1 cent) | 22 | 100 | 12 | 80 | 10 | 76 |

*Ages are expressed in years and months

Knowledge of Comparative Value

The comparative value task, Test III, measured the children's ability to recognize the coin of greater value in a pair of coins. For this test, all possible combinations of the five coins, from a penny to a half-dollar, were presented to the child twice. Children were credited

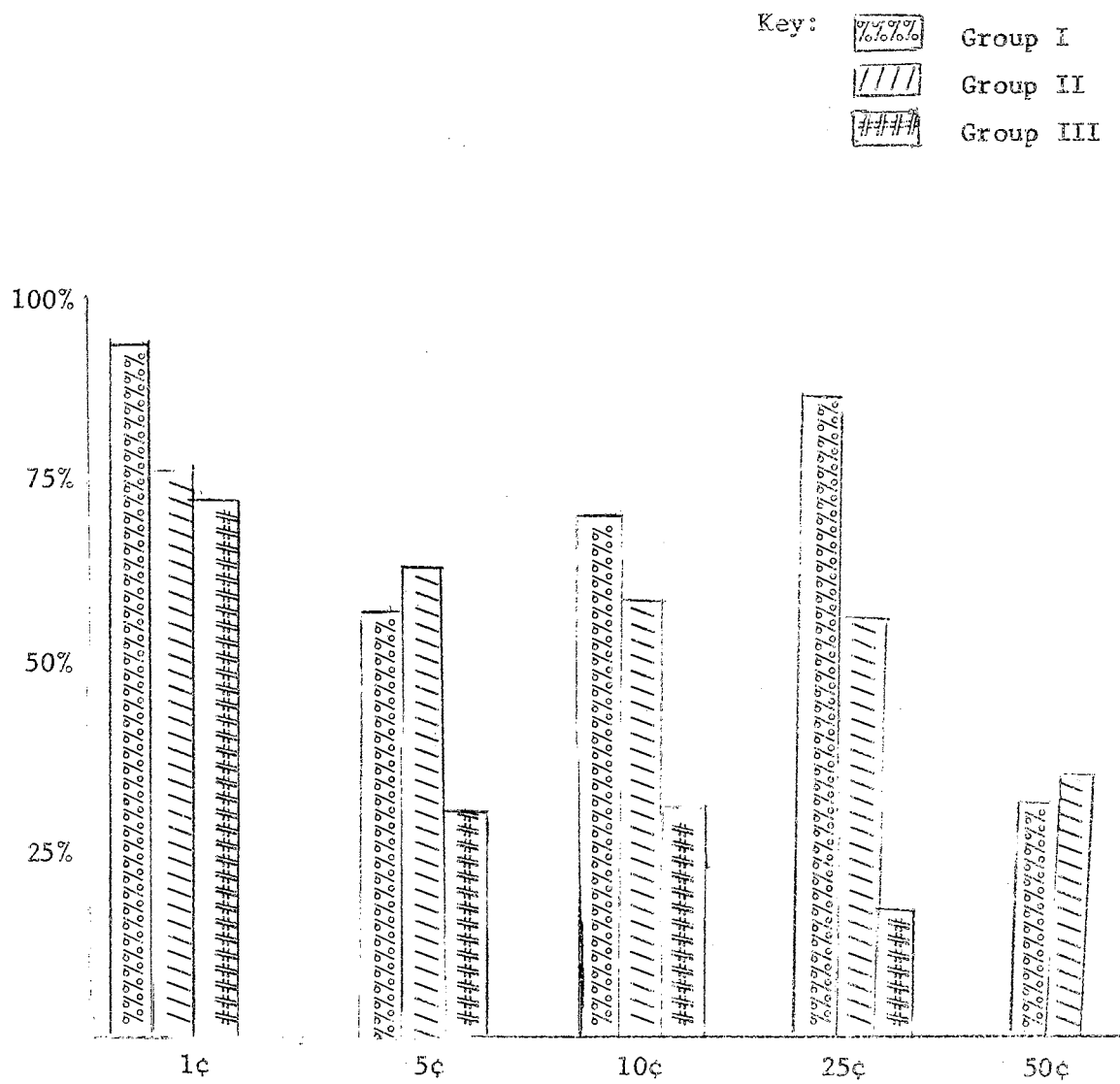


Figure 1. Percent of Children in Three Age Groups Responding Correctly in a Coin-Identification Task. (N = 50)

with knowing the comparative value of a pair of coins if they responded correctly both times that the pair was presented.

The frequency and percent of correct responses for each pair of coins is presented by age groups in Table IV. Analysis of these data indicated that the older children responded correctly more often than the younger children (chi-square = 8.39; $p < .02$).

TABLE IV
FREQUENCY AND PERCENT OF CORRECT RESPONSES OF PRESCHOOL
CHILDREN ON A COMPARATIVE VALUE TASK,
BY AGE GROUPS
(N = 50)

| Paired Coins | Group I (N 22) 5-1 to 5-6* | | Group II (N 15) 4-6 to 5-0 | | Group III (N 13) 4-0 to 4-5 | | Total | |
|--------------|----------------------------------|----|----------------------------------|----|-----------------------------------|----|-------|----|
| | N | % | N | % | N | % | N | % |
| | | | | | | | | |
| 50¢-25¢ | 19 | 86 | 09 | 60 | 06 | 46 | 34 | 68 |
| 50¢-10¢ | 19 | 86 | 11 | 73 | 09 | 69 | 39 | 78 |
| 50¢-05¢ | 21 | 95 | 10 | 67 | 07 | 54 | 38 | 76 |
| 50¢-01¢ | 21 | 95 | 12 | 80 | 10 | 77 | 43 | 86 |
| 25¢-10¢ | 19 | 86 | 12 | 80 | 07 | 54 | 38 | 76 |
| 25¢-05¢ | 19 | 86 | 12 | 80 | 06 | 46 | 37 | 74 |
| 25¢-01¢ | 17 | 77 | 11 | 73 | 11 | 85 | 39 | 78 |
| 10¢-05¢ | 07 | 31 | 02 | 13 | 02 | 15 | 11 | 22 |
| 10¢-01¢ | 16 | 73 | 09 | 60 | 06 | 46 | 30 | 60 |
| 05¢-01¢ | 18 | 82 | 10 | 67 | 07 | 54 | 35 | 70 |
| Total | 176 | 80 | 98 | 65 | 71 | 55 | 344 | 69 |

* Ages are expressed in years and months

A closer examination of the data in Table IV indicates that the children tended to relate the size of the coin to the value of the coin, e.g., the choice of the coin of greater value may have been a choice of the coin of larger size. The greatest number of incorrect responses were made when the dime and nickel were paired. Only 11 children, out of 50, responded correctly. Fewer incorrect responses were given when the dime was paired with the penny. To this combination, 30 children responded correctly. The implication is that the many correct responses to the half-dollar and quarter may have been responses to size rather than to value, and that the children did not actually understand the comparative value of these coins.

Knowledge of Equivalent Value

The equivalent value task, Test IV, measured the children's ability to recognize the combination of coins which were equal in value to one coin of greater value. This test was presented to the Group I children and not to the younger children.

The frequency of correct and incorrect responses is presented in Table V. Few of the children understood the value of coins. Five children were able to show the equivalent value for a dime and a nickel; but only one child could show the equivalent value for a quarter and a half-dollar.

The equivalent value for a dime was shown in several ways. Two children used two nickels; two children used ten pennies; and one child used one nickel and five pennies. The latter child also matched the value of a quarter with two dimes and a nickel, and seemed to be the one child in the group who really understood the value of the coins.

TABLE V
 FREQUENCY OF CORRECT AND INCORRECT RESPONSES OF PRESCHOOL
 CHILDREN* ON AN EQUIVALENT VALUE TASK
 (N = 22)

| Coin | Correct Responses | Incorrect Responses |
|-------------|----------------------|------------------------|
| Half-dollar | 1 | 21 |
| Quarter | 1 | 21 |
| Dime | 5 | 17 |
| Nickel | 5 | 17 |
| Total | 12 | 76 |

*Group I only; age range: 5-0 to 5-6

Summary

Findings

1. Children's ability to identify coins as money increases with age.
2. Children's ability to identify coins by name increases with age; and coins of smaller denomination are correctly identified more frequently than coins of larger denomination.
3. Children's ability to identify the comparative value of coins increases with age.

Observations by Investigator

1. Certain characteristics of non-money objects were more easily identified than others. (e.g., the charm and the bus token were more frequently confused with money than the plastic objects.)

2. Children tended to relate the value of the coin to its size; inasmuch as, they most frequently chose the larger of two coins as the coin of greater value. This was particularly true in the dime-nickel combination.

3. The equivalent value of money is one of the last monetary concepts to be acquired. Few children were able to perform this task. Those who could perform the task seemed to have acquired knowledge of the equivalent value of the nickel and dime first.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The purpose of this study was to investigate the preschool child's (1) ability to differentiate coins as money, (2) his ability to identify coins by name, and (3) his ability to identify the value of coins.

Four tests were devised to measure the foregoing skills. Test I measured the child's ability to differentiate coins as money; Test II measured the child's ability to identify coins by name; Test III measured the child's knowledge of the comparative value of coins; and Test IV measured the child's knowledge of the equivalent value of coins.

The investigator administered the four tests individually to fifty preschool children ranging in age from four years to five years and six months. The subjects were divided into three age groups as follows: Group I, 5-1 to 5-6; Group II, 4-6 to 5-0; Group III, 4-0 to 4-5.

The data were analyzed to determine (1) the skills the child possesses at a given age and (2) the errors one might expect the child to commit before he develops the necessary knowledge to accomplish these skills.

Findings

1. Children's ability to identify coins as money increases with age.

2. Children's ability to identify coins by name increases with age, and coins of smaller denomination are correctly identified more frequently than coins of larger denomination.

3. Children's ability to identify the comparative value of coins increases with age.

Observations by Investigator

1. Certain characteristics of non-money objects were more easily identified than others. (e.g., the charm and the bus token were more frequently confused with money than were the plastic objects.)

2. Children tended to relate the value of a coin to its size, inasmuch as they most frequently chose the larger of two coins as the coin of greater value. This was particularly true in the dime-nickel combination.

3. The equivalent value of money is one of the last monetary concepts to be acquired. Few children were able to perform this task. Those who could perform the task seemed to have acquired knowledge of the equivalent value of the nickel and dime first.

Recommendations for Further Research

The following suggestions are made on the basis of findings of this investigation:

1. The preliminary pilot testing indicated to the investigator that the final tests adequately differentiated those children who had acquired certain monetary skills from those who had not; however, validity and reliability of the tests cannot be clearly established without further testing. This should be done at a later date.

2. A similar study using a larger and more representative sample of children should be conducted if generalizations are to be made. Such a study should include children younger than four years of age.

3. An accurate record of the sequence in which children sort the money and non-money items and the characteristics which help the children identify those items should be studied.

4. The preschool child's experience with money should be studied and correlated with his ability to exhibit the skills investigated in order to determine what experiences are effective in developing realistic money concepts. On the basis of such information, recommendations could be made to parents and educators about effective educational methods for the young child.

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APPENDIX A

TABLE VI

FREQUENCY OF CORRECT RESPONSES OF INDIVIDUAL CHILDREN OF THE
TASKS DESIGNED TO MEASURE MONEY CONCEPTS
OF PRESCHOOL CHILDREN
(N = 50)

| Sex and Code Number | Age | Sorting Task | Identification Task | Comparative Value | Equivalent Value |
|------------------------|------|-----------------|------------------------|----------------------|---------------------|
| M-1 | 5.6 | 10 | 4 | 8 | |
| M-2 | 5.6 | 11 | 3 | 9 | |
| F-3 | 5.5 | 9 | 3 | 10 | |
| M-4 | 5.5 | 11 | 6 | 10 | 2 |
| F-5 | 5.5 | 11 | 10 | 10 | 4 |
| F-6 | 5.4 | 11 | 7 | 6 | |
| M-7 | 5.4 | 11 | 5 | 9 | 2 |
| F-8 | 5.4 | 11 | 4 | 8 | |
| M-9 | 5.4 | 9 | 2 | 8 | |
| F-10 | 5.4 | 11 | 1 | 8 | |
| F-11 | 5.4 | 11 | 6 | 8 | |
| M-12 | 5.4 | 10 | 2 | 9 | 2 |
| M-13 | 5.4 | 11 | 3 | 3 | |
| M-14 | 5.4 | 6 | 1 | 7 | |
| M-15 | 5.3 | 9 | 10 | 5 | |
| F-16 | 5.3 | 10 | 3 | 9 | |
| F-17 | 5.3 | 7 | 3 | 8 | |
| M-18 | 5.2 | 10 | 8 | 6 | |
| F-19 | 5.2 | 10 | 6 | 10 | 2 |
| M-20 | 5.1 | 10 | 7 | 9 | |
| M-21 | 5.1 | 9 | 6 | 7 | |
| F-22 | 5.1 | 1 | 7 | 9 | |
| M-23 | 5.0 | 5 | 3 | 7 | |
| M-24 | 5.0 | 10 | 8 | 9 | |
| M-25 | 4.10 | 7 | 2 | 7 | |
| F-26 | 4.10 | 10 | 6 | 9 | |
| M-27 | 4.8 | 9 | 2 | 9 | |
| F-28 | 4.8 | 9 | 5 | 8 | |
| F-29 | 4.8 | 9 | 1 | 7 | |
| F-30 | 4.8 | 9 | 4 | 5 | |
| F-31 | 4.7 | 11 | 5 | 4 | |
| F-32 | 4.7 | 5 | 0 | 1 | |
| M-33 | 4.6 | 10 | 8 | 4 | |
| M-34 | 4.6 | 11 | 2 | 5 | |
| F-35 | 4.6 | 10 | 4 | 8 | |
| M-36 | 4.6 | 7 | 4 | 9 | |
| F-37 | 4.6 | 11 | 2 | 6 | |

TABLE VI (Continued)

| Sex and Code Number | Age | Sorting Task | Identification Task | Comparative Value | Equivalent Value |
|------------------------|-----|-----------------|------------------------|----------------------|---------------------|
| M-38 | 4.5 | 9 | 3 | 6 | |
| F-39 | 4.5 | 10 | 3 | 3 | |
| M-40 | 4.4 | 8 | 1 | 6 | |
| F-41 | 4.4 | 7 | 2 | 9 | |
| M-42 | 4.3 | 9 | 0 | 3 | |
| M-43 | 4.3 | 9 | 2 | 8 | |
| M-44 | 4.3 | 8 | 2 | 7 | |
| M-45 | 4.3 | 6 | 4 | 6 | |
| F-46 | 4.3 | 4 | 1 | 4 | |
| F-47 | 4.3 | 3 | 0 | 5 | |
| M-48 | 4.3 | 6 | 2 | 7 | |
| M-49 | 4.1 | 8 | 4 | 8 | |
| M-50 | 4.0 | 6 | 0 | 5 | |

APPENDIX B

TEST I - MONEY-SORTING TASK

The purpose of the money-sorting task is to investigate children's ability to differentiate coins as money.

Materials needed: A small purse containing coins (half-dollar, quarter, dime, nickel, and penny) and non-money objects (a plastic fifty cent piece, a bracelet charm resembling money, a plastic dime, a tin dime, a bus token, and a plastic penny).

Procedure: The child is shown the purse and told, "I have some real pieces of money for a real store and some 'pretend pieces' for a 'pretend store'." The coins and non-money objects are then taken from the purse and shown to the child. He is then instructed to sort them by saying, "Put the real pieces of money for a real store over here (investigator indicates a place for the coins) and put the 'pretend pieces' for a 'pretend store' over here." (Investigator indicates a place.)

The manner in which the child sorts the objects is recorded.

TEST II - COIN IDENTIFICATION TASK

The purpose of the coin identification task is to investigate children's ability to identify coins by name.

Materials needed: Two quarters, two half-dollars, two dimes, three nickels and two pennies.

Procedure: The coins are placed before the child in the following pattern.

25-10-25
10-5-1-5-25
1-50-5

The investigator says, "I have some real pieces of money on the table. Can you put your finger on a penny?" When the child responds, the investigator says, "Good." In this manner, the investigator directs the child either to put his finger on (a penny) or on a piece that is (one cent), in the following order:

- | | |
|----------------------|-----------------------|
| 1. A penny | 10. A quarter |
| 2. A nickel | 11. Ten cents |
| 3. A dime | 12. A nickel |
| 4. A half-dollar | 13. Twenty-five cents |
| 5. One cent | 14. A half-dollar |
| 6. Five cents | 15. One cent |
| 7. Ten cents | 16. A dime |
| 8. Twenty-five cents | 17. Fifty cents |
| 9. Fifty cents | 18. A penny |
| | 19. Five cents |

The child's correct responses are recorded. The child is credited with identifying the coin if both his responses are correct, e.g., two responses for a penny or two responses for one cent.

TEST III - COMPARATIVE VALUE TASK

The purpose of the comparative value task is to investigate children's ability to identify coins of greater and lesser value.

Materials needed: The half-dollar, quarter, dime, nickel and penny are paired twice in all possible combinations. The pairs are mounted on three by five cards so that the coin of greater value in each pair will appear once on the left and once on the right.

Procedure: The investigator asks the child, "Do you go to the store with your mother sometimes?" (child responds) "What do you buy?" (If candy is not mentioned, the investigator again asks, "Do you buy candy sometimes?") The child is then shown the first card of paired coins. The investigator instructs the child to choose the coin of greater value by saying, "Show me the coin that would buy the most candy at the store." In this manner, the investigator instructs the child to choose the coin of greatest value in each of the following pairs:

- | | |
|--------------------------|---------------------------|
| 1. Half-dollar - quarter | 11. Dime - nickel |
| 2. Dime - nickel | 12. Half-dollar - quarter |
| 3. Penny - half-dollar | 13. Penny - dime |
| 4. Dime - quarter | 14. Nickel - half-dollar |
| 5. Nickel - penny | 15. Quarter - penny |
| 6. Half-dollar - dime | 16. Half-dollar - dime |
| 7. Quarter - nickel | 17. Nickel - penny |
| 8. Penny - dime | 18. Dime - quarter |
| 9. Nickel - half-dollar | 19. Penny - half-dollar |
| 10. Quarter - penny | 20. Quarter - nickel |

The child's choices are recorded on the score sheet.

TEST IV - EQUIVALENT VALUE TASK

The purpose of the equivalent value task is to investigate children's ability to match coins with coins of equivalent value.

Materials needed: (1) A variety of small inexpensive toys; four were used for each child, and (2) a four-shelf rack on which the toys could be placed. A coin was glued to each shelf to indicate the price of the toy on that shelf (top shelf, nickel; second shelf, dime; third shelf, quarter; fourth shelf, half-dollar); (3) four small purses or containers; one containing seven pennies and one dime for matching the nickel; one containing three nickels and eleven pennies for matching the dime; one containing five nickels, three dimes and a half-dollar for matching the quarter and one containing three quarters, seven dimes, six nickels and a penny for matching the half-dollar. (It is helpful to match the color of the shelf to the color of the purse.)

Procedure: The child is shown four toys and the investigator instructs them to choose one by saying, "These are the toys I have in my store. You may choose one that you would like to buy." The investigator places the toy chosen by the child on the top shelf and puts the other toys out of sight.

The purse to be used in matching the nickel is given to the child. The investigator points to the toy saying, "Let us pretend that the (toy) costs this much (indicating the coin on that shelf). You may buy it with the money in this purse. Give me the money you would need to buy the (toy)." (The investigator holds out her hand as if to accept the coins.) When the child chooses his coins the investigator records

his choice and says, "Good. You could buy it with that purse, couldn't you? Now let us see if this purse will buy the (toy)?" (The purse for the dime is given to the child.) The investigator then moves the toy to the next shelf and says, "Now let us pretend that the (toy) costs this much" (indicating the dime). In this same manner, the child is requested to match the quarter and the half-dollar with coins of equal value.

The child's choices are recorded on the score sheet.

SCORE SHEET

NAME

AGE

DATE

TEST I - MONEY-SORTING TASK

| | | | | | | | | | | | |
|-------------|----|----|---|---|---|-----------------|---|-----|-----|----|----|
| 50 | 25 | 10 | 5 | 1 | 1 | p50 | C | p10 | t10 | BT | p1 |
| Money Items | | | | | | Non-money Items | | | | | |

* Check each object correctly sorted as a money-non-money item.

TEST II - COIN IDENTIFICATION TASK

| | | | | | | | | | |
|-------------|---------|------|--------|-------|----|----|----|---|---|
| Half Dollar | Quarter | Dime | Nickel | Penny | 50 | 25 | 10 | 5 | 1 |
|-------------|---------|------|--------|-------|----|----|----|---|---|

* Step one - Check each coin correctly identified
 Step two - Circle each coin correctly identified

TEST III - COMPARATIVE VALUE TASK

| | | | | | | | |
|----|----|----|----|----|---|---|----|
| 50 | 25 | 25 | 50 | 25 | 5 | 5 | 25 |
| 50 | 10 | 10 | 50 | 25 | 1 | 1 | 25 |
| 50 | 5 | 5 | 50 | 10 | 5 | 5 | 10 |
| 50 | 1 | 1 | 50 | 10 | 1 | 1 | 10 |
| 25 | 10 | 10 | 25 | 5 | 1 | 1 | 5 |

* Check the coin chosen in each pair

TEST IV. - EQUIVALENT VALUE TASK

| COIN | CORRECT RESPONSE | INCORRECT RESPONSE |
|-------------|------------------|--------------------|
| Half-dollar | | |
| Quarter | | |
| Dime | | |
| Nickel | | |

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