

A COMPARISON OF MONETARY CONCEPTS OF
KINDERGARTEN AND FIRST
GRADE CHILDREN

By

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the 1990s, the number of people in the world who are under 15 years of age is expected to increase by 1.2 billion, from 1.1 billion in 1990 to 2.3 billion in 2010. The number of people aged 65 and over is expected to increase by 1.1 billion, from 0.4 billion in 1990 to 1.5 billion in 2010. The number of people aged 15-64 is expected to increase by 1.1 billion, from 1.1 billion in 1990 to 2.2 billion in 2010. The number of people aged 65 and over is expected to increase by 1.1 billion, from 0.4 billion in 1990 to 1.5 billion in 2010. The number of people aged 15-64 is expected to increase by 1.1 billion, from 1.1 billion in 1990 to 2.2 billion in 2010.

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CHAPTER I

THE PROBLEM AND ITS IMPORTANCE

This study was concerned with the monetary concepts of kindergarten and first grade children enrolled in public schools. McCarty (1967) validated a test of four monetary tasks for three- and four-year-olds. This same test was validated for urban kindergarten age children (Dunkin, 1972), rural kindergarten age children (Harper, 1973), low income black children (Masters, 1971), first grade children (Dale, 1973), and third grade children (Anderson, 1974).

Need for the Study

In general, the economy today has placed greater restrictions on the amount of money available for individuals to spend. One factor which may have contributed to this has been the increase in single-parent families. Usually, these families have a more restrictive budget than a two-parent family, and the children may have been more likely to be included in the economics of the family. Lack of money is a concept which is often difficult for young children to understand. Children encounter this problem when they want things and are told that the parent does not have the money. The understanding of this problem for children is made increasingly difficult with the frequent use of checks and credit cards.

Money may seem unnecessary as long as a check or credit card is available since a young child has little understanding of the relationship between coins and credit.

Children are exposed to complex economic problems; therefore, there is a continuing need for children to have basic understandings of monetary concepts and for parents and teachers to plan for providing learning experiences related to monetary concepts in both formal and informal situations. Studies by McCarty (1967), Dunkin (1972), Harper (1973), Masters (1971), Dale (1973), and Anderson (1974), involving monetary concepts, found children from the ages of three to six years to be lacking in some of the monetary concepts tested on the Monetary Concepts Task Test.

There has been little recent research on the economic concepts that young children possess when they come to school. Most recent studies indicate that concepts about the value and use of money follow a developmental sequence (Berti and Bombi, 1981).

Purpose of the Study

The major purpose of this study was to compare the abilities of kindergarten and first grade children on the four tasks of the Monetary Concepts Task Test developed by McCarty (1967). Other purposes included: (1) comparison of responses of kindergarten boys and first grade boys to the four tasks of the Monetary Concepts Task Test, (2) comparison of responses of kindergarten girls and first grade girls to the four tasks of the Monetary Concepts Task Test, (3) comparison of responses of kindergarten girls and kindergarten boys to the four tasks of the Monetary Concepts Task Test, and (4) comparison of responses of first grade girls and first grade boys to the four tasks of the Monetary Concepts Task Test.

The monetary tasks which were measured were: (1) the ability to identify coins as money, (2) the ability to identify coins by name, (3) the ability to identify the value of coins, and (4) the ability to determine equivalent values of coins.

Hypotheses

This study examined the following hypotheses:

- (1) There will be no significant difference between kindergarten children and first grade children in their responses to the four tasks of the Monetary Concepts Task Test:
 - (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (2) There will be no significant difference between kindergarten boys and first grade boys in their responses to the four tasks of the Monetary Concepts Task Test:
 - (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (3) There will be no significant difference between kindergarten girls and first grade girls in their responses to the four tasks of the Monetary Concepts Task Test:
 - (a) to identify coins as money
 - (b) to identify coins by name

- (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (4) There will be no significant difference between kindergarten boys and kindergarten girls in their responses to the four tasks of the Monetary Concepts Task Test:
- (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (5) There will be no significant difference between first grade boys and first grade girls in their responses to the four tasks of the Monetary Concepts Task Test:
- (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.

Assumptions

The following assumptions were made for the study:

- (1) The children who were absent and not tested would respond in a similar manner to those children who were given the Monetary Concepts Task Test.
- (2) The children who were tested had not had a structured math unit dealing with monetary concepts.
- (3) Based upon kindergarten screening, the children tested in kindergarten were at similar developmental levels.

(4) Based on screening prior to entrance in first grade, the children tested in first grade were at similar developmental levels.

CHAPTER II

RELATED LITERATURE

This chapter reviews literature related to monetary experiences and consumer practices of young children. The information is presented in the following categories: (1) Development of Monetary Concepts, (2) Young Children's Knowledge and Experience with Money, (3) The Need for Consumer Education, and (4) Implications for the Present Study.

Development of Monetary Concepts

There has been recent interest in the information which children already possess when they come to school (Fox, 1978). Fox (1978) noted that people obtain most of their economic information from areas other than formal education, this information usually coming from direct experience.

It has been found that children's concepts about the value and use of money follow a developmental sequence (Berti and Bombi, 1981). Berti and Bombi (1981) developed a category system of six stages which they felt children go through in their development of monetary concepts. The researchers arrived at these six stages by testing 80 children, eight boys and eight girls, at five different age levels. The stages were:

(1) no awareness of payment--In this stage the children did not pay during the store game or recognize money.

(2) obligatory payment--Children in the second stage recognize that the customer must pay, but they do not discriminate between various kinds of money or bills.

(3) not all types of money can buy everything--Children in this stage show that they do not consider all money types to be equivalent.

(4) sometimes the money is insufficient--In the fourth stage children recognize that some things cost more and some less and that certain types of money are not sufficient.

(5) strict correspondence between money and objects--Children in this stage establish an exact correspondence between the value of monetary denominations and the prices of objects.

(6) the correct use of change--Children in the sixth stage realize that "the excessive value of money, with respect to the price, may be compensated for by the storekeeper's giving the difference in money to the customer." (Berti and Bombi, 1981 p. 1181).

Berti and Bombi (1981) concluded that the progression through the first four of these stages was developed around preoperational thinking. These understandings seemed to depend on direct experience. The fifth and sixth stages involved the use of logical and mathematical operations.

Further research has been done using Jean Piaget's cognitive developmental theory as the basis for investigating the economic reasoning of children (Schug, 1983). Schug (1983) found that children's basic economic concepts fit well with the principles of cognitive development theory. This finding indicates that it might be beneficial for teachers to use theories of cognitive development to assist in the development of an economic curriculum appropriate to each grade level.

Strauss (1952) agreed with the idea that young children advanced by stages in their monetary concept development. As the child moves from level to level his behavior undergoes transformation. Strauss found that children could distinguish between money and non-money objects as early as three years of age, however, these three- and four-year-olds could not consistently match pairs of coins.

Strauss and Schuessler (1951) hypothesized that "significant differences in logical reasoning among children of different ages exist." Three tests were given children in a monetary concepts test, and Strauss and Schuessler found that certain items could not be passed unless "certain logical operations were previously mastered." This led to their conclusions that monetary concepts develop in stages and that certain concepts must be mastered before a child is able to move to the next stage (Strauss and Schuessler, 1951).

Strauss and Schuessler (1951) found that between the ages of 56 months and 71 months children were capable of distinguishing nickels from other coins. The child at this stage understood that money had to do with buying but felt any coin would buy anything. McCarty (1967) found that children's ability (1) to identify coins as money, (2) to identify coins by name, and (3) to identify the comparative value of coins, increased with age.

Robison (1964) tested two groups of five-year-olds on their ability to identify six denominations of money. Each group consisted of 25 children from high socio-economic status. These children were first tested in February 1962 and again after a ten-week period in which the experimental group was presented planned learning experiences dealing with consumerism. At the first testing four children in each group were

able to identify all the money, which included a one-dollar bill, a check, a quarter, a dime, a nickel, and a penny. In addition, four children in each group correctly identified five out of six items. After the ten weeks of planned experiences, 15 children in the experimental group showed score increases on money identification tests, in addition to the four children who maintained perfect scores. Ten children were able to identify all six types of money. The control group scores remained unchanged.

Danziger (1959) tested 41 Australian school children between the ages of five and eight years. They were asked a series of ten questions which dealt with various economic processes. He found that four stages occurred in the development of economic concepts:

- (1) An initial pre-categorical stage occurs when the child lacks economic categories of thought altogether.
- (2) At the second, or categorical, stage the child's concepts appear to represent a reality in terms of isolated acts which are explained by a moral or voluntaristic imperative.
- (3) At the third stage the child becomes able to conceptualize relationships as such, by virtue of the fact that a reciprocity is established between previously isolated acts. But these relationships are in their turn isolated and cannot be explained in terms of other relationships.
- (4) Finally, the isolated relationships become linked to each other so as to form a system of relations. (pp. 239-241)

Tan and Stacey (1981) interviewed 120 Malaysian Chinese school children, aged 6 to 15 years to determine their understanding of socio-economic concepts. This study showed a developmental trend in the acquisition and understanding of socio-economic concepts very similar to those found in studies of Western children. Tan and Stacey (1981) concluded that each advance in economic concept development depends on the understanding of prerequisite notions.

Eliot (1932) and Neisser (1960) suggested that the emotional climate of the home was instrumental in the development of the child's attitudes

toward money. Neisser (1960) stated that "children who grow up in homes where parents have been unable to meet their need for love may use money as a substitute for affection." Wohlner (1971) felt that parents' attitudes toward money largely determined how their children responded emotionally to money.

Young Children's Knowledge and Experience with Money

Prevey (1945) found that there was a significant relationship between the early practices that children had with acquiring and spending money and their ability to handle money wisely in the future. Many researchers (Andrews, 1932; Danziger, 1959; Eliot, 1932; Harris and Harris, 1964; Prevey, 1945; Wohlner, 1971) have stressed the importance of providing children with money of their own which they can use as a tool in developing management practices. Grojean (1972), in a study of preschool children, found that all the children had experiences in obtaining and spending money.

Investigators (Andrews, 1932; Dunsing, 1956; Grojean, 1972; Harris and Harris, 1964; Neisser, 1960; Wohlner, 1971) have found that young children usually received money from their parents in one of three ways: (1) through a dole system, (2) by earning money from odd jobs, or (3) by an allowance. These investigators felt that an allowance was the best system for encouraging knowledge and wise use of money.

Wohlner (1971) advised that children should have their own money to handle and the freedom to make mistakes with their money. She also suggested that the family as a group should evaluate the child's wants

and needs in order to determine an amount for beginning allowance. Then, as the child grows older and shows his ability to assume responsibility his allowance should be increased.

The Need for Consumer Education

The study of economics has shifted to curricula for lower grades as a result of many state mandates to include economics education in the primary grades (Koeller, 1981). There have been several recent studies illustrating methods used to teach economics with children as young as kindergarten age (Bradford, 1980; Daane, 1980; Glazzard and Porter, 1979; Kourilsky, 1977; Spaur-Rowland, 1979).

Koeller (1981) looked at several key questions concerning economics and the education of young children. She stated that there was little doubt that young children should be exposed to economics education, but the question was how they should be taught and what they should be taught.

Kourilsky's (1977) study involved 95 children from 5 kindergartens. These children participated in a program of selected economic concepts for 30 minutes a day over an entire semester. When the program was completed the children were tested on their comprehension of ten concepts: scarcity, decision-making, opportunity cost and cost-benefit analysis, production, specialization, distribution, consumption and savings, demand and supply, business organization and business venture, and money and barter. It was found that generally children ages 5 to 6 years were able to master selected economic concepts by the end of the semester. These concepts included scarcity/economic problems, decision-making and cost-benefit analysis, production, and business organization. The highest

level of mastery was found for the content in the unit on scarcity and economic problems. The most difficult area to master appeared to be specialization.

Ryan and Carlson (1973) studied first grade children to determine the effects of two teaching strategies, discovery and expository (telling), on their learning of economic concepts. Three groups of first graders were used: Group D (discovery), Group E (expository), and Group C (control). The lesson plans for Groups D and E were similar insofar as the plans for both groups contained the same five instructional elements. These elements were review, lead-in, investigation, summary, and future. The materials used in the instruction of Groups D and E were identical. Group D differed from Group E in that Group D subjects were provided with numerous opportunities to "discover" understandings, and learner involvement was provided for Group D. The C group was involved in a series of language arts lessons which lasted throughout the study while the D and E groups received social studies instruction. The results of this research indicated that the children who listened to records learned at a significant level, but the discovery strategies were less successful. The researchers felt that it is time to "...identify those requisite conditions which serve to set the stage for learners to thrive in discovery situations" (Ryan and Carlson, 1973, p. 447).

Implications for the Present Study

The following findings from the literature had implications for the present study: (1) children are involved in the consumer process at a very young age; (2) monetary concepts develop continuously and sequentially; (3) the development of monetary concepts depends upon the

actual experience children have in the use of money; (4) children are actively participating in the market place; and (5) there is the need for research to determine the levels of monetary competence of young children. Each of these findings could aid educators to develop a curriculum unit in helping children to understand monetary concepts specific to their different grade levels.

CHAPTER III

DESIGN OF RESEARCH

The type of research implemented in this study was descriptive. The purpose of descriptive research is "to describe systematically the facts and characteristics of a given population or area of interest, factually and accurately" (Isaac and Michael, 1982, p.46). One method of descriptive research suggested was survey research. The purposes of survey research are:

- a. To collect detailed factual information that describes existing phenonema.
- b. To identify problems or justify current conditions and practices.
- c. To make comparisons and evaluations.
- d. To determine what others are doing with similar problems or situations and benefit from their experience in making future plans and decisions. (Isaac and Michael, p.46)

Information was collected which described kindergarten and first grade children's knowledge of certain monetary concepts. With this information, areas were identified in which kindergarten and first grade children had difficulty. Survey research was used to make comparisons between first grade and kindergarten children on monetary concepts. This type of research was further used to compare differences by sex within the first grade and within the kindergarten.

Method and Procedure

The Monetary Concepts Task Test developed by McCarty (1967), and utilized by West (1971) with three- and four-year-olds, by Dunkin (1972) with urban kindergarteners, by Harper (1973) with rural kindergarteners, by Dale (1973) with first grade children, and by Anderson (1974) with third grade children was used to determine the monetary concepts of kindergarten and first grade children in this study. A score sheet was utilized for recording responses to the four tasks (Appendix A).

The Monetary Concepts Task Test was utilized by the examiner in testing kindergarten and first grade children between September 16, 1985, and October 4, 1985, prior to formal instruction of monetary concepts. The kindergarten children were examined on an individual basis outside of the classroom. First grade children were tested on an individual basis in a small room at the back of the classroom.

For this study, the Monetary Concepts Task Test (McCarty, 1967) took approximately 10-15 minutes to give to each child. The examiner was able to test approximately 63 children per week. The kindergarten children were tested from September 16 through September 25, 1985. The first grade children were tested from September 26 through October 4, 1985. Eight testing days (excluding weekends) for the kindergarten children and seven testing days (excluding weekends) for the first grade children were utilized in gathering the data (Appendix B).

Subjects

This study was conducted during the fall semester of 1985. The sample was composed of 96 kindergarten children and 93 first grade children in a rural Oklahoma community. Table I presents information describing subjects according to age, sex and grade level. Nearly equal numbers of boys and girls, and first grade and kindergarten children participated in this study.

TABLE I
CHILDREN BY AGE, SEX, AND GRADE LEVEL

Grade Level	Age*	Boys	Girls	Total
Kindergarten	5-0 to 6-8	47	49	96
First Grade	6-0 to 8-5	46	47	93
Total		93	96	189

*Age is reported in years and months.

Instrument

The Monetary Concepts Task Test developed by McCarty (1967) and further validated by West (1971), Dunkin (1972), Harper (1973), Masters (1971), Dale (1973) and Anderson (1974) was used to determine the monetary concept levels of understanding for the subjects in this study. A description of the four tasks as reported by McCarty (1967) follows.

Test I--Money-Sorting Task

The purpose of the money-sorting task is to investigate the child'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 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:

25-10-50
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 | 11. Ten cents |
| 2. A nickel | 12. A nickel |
| 3. A dime | 13. Twenty-five cents |
| 4. A half dollar | 14. A half dollar |
| 5. One cent | 15. One cent |
| 6. Five cents | 16. A dime |
| 7. Ten cents | 17. Fifty cents |
| 8. Twenty-five cents | 18. A penny |
| 9. Fifty cents | 19. Five cents |
| 10. A quarter | 20. A quarter |

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's 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's 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.

Collection of the Data

The Monetary Concepts Task Test developed by McCarty (1967) was followed for this research on the last three tasks. The Money Sorting Task was changed slightly. The real coins used for this task were identical to coins used by McCarty in 1967. The non-money objects in this study included a plastic half dollar, a plastic quarter, a plastic dime, a plastic nickel, a plastic penny, a video machine token and a Mardi Gras coin.

This study was conducted in the fall of 1985 in a rural Oklahoma community with a population of approximately 5,000-6,000 people. The examiner contacted the principal of the elementary school and received approval to conduct this research. The first grade and kindergarten teachers allowed the examiner to take the children from the classroom on an individual basis from 8 o'clock to 9 o'clock in the morning and from 12 o'clock to 1 o'clock in the afternoon.

Analysis of Data

The statistical analysis of this study was processed by the computer center on the Oklahoma State University campus. The t-test was utilized in examining the following hypotheses:

- (1) There will be no significant difference between kindergarten children and first grade children in their response to the four tasks of the Monetary Concepts Task Test:
 - (a) to identify coins as money
 - (b) to identify coins by name

- (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (2) There will be no significant difference between kindergarten boys and first grade boys in their responses to the four tasks of the Monetary Concepts Task Test:
- (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (3) There will be no significant difference between kindergarten girls and first grade girls in their response to the four tasks of the Monetary Concepts Task Test:
- (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (4) There will be no significant difference between kindergarten boys and kindergarten girls in their responses to the four tasks of the Monetary Concepts Task Test:
- (a) to identify coins as money
 - (b) to identify coins by name
 - (c) to identify the value of coins
 - (d) to determine equivalent values of coins.
- (5) There will be no significant difference between first grade boys and first grade girls in their responses to the four tasks of the Monetary Concepts Task Test:

- (a) to identify coins as money
- (b) to identify coins by name
- (c) to identify the value of coins
- (d) to determine equivalent values of coins.

CHAPTER IV

FINDINGS OF THE STUDY

The major purpose of this study was to compare the abilities of kindergarten (N=96) and first grade children (N=93) on the Monetary Concepts Task Test developed by McCarty (1967). Other purposes which were also examined were: (1) to compare responses of kindergarten boys and first grade boys to the four tasks of the Monetary Concepts Task Test, (2) to compare responses of kindergarten girls and first grade girls to the four tasks of the Monetary Concepts Task Test, (3) to compare responses of kindergarten boys and kindergarten girls to the four tasks of the Monetary Concepts Task Test, and (4) to compare responses of first grade boys and first grade girls to the four tasks of the Monetary Concepts Task Test. The four monetary tasks which were measured in this test were: (1) the ability to identify coins as money, (2) the ability to identify coins by name, (3) the ability to identify the value of coins, and (4) the ability to determine equivalent values of coins.

Examination of Hypotheses

The t-test was employed to analyze the responses of kindergarten children and first grade children on the four tasks of the Monetary Concepts Task Test.

Hypothesis 1: There is no significant difference between kindergarten children and first grade children in their responses to the four tasks of the Monetary Concepts Task Test: (a) to identify coins as money, (b) to identify coins by name, (c) to identify the value of coins, and (d) to determine equivalent values of coins.

Upon examination of the data, it was noted that a significant difference existed between kindergarten children and first grade children in their ability to identify coins as money ($p=0.0037$), to identify coins by name ($p=0.0001$), to identify the value of coins ($p=0.0003$), or to determine the equivalent values of coins ($p=0.0001$). First grade children consistently outscored kindergarten children in each subtest area.

Hypothesis 2: There was no significant difference between kindergarten boys and first grade boys in their responses to the four tasks of the Monetary Concepts Task Test: (a) to identify coins as money, (b) to identify coins by name, (c) to identify the value of coins, and (d) to determine equivalent values of coins.

The data were examined for Hypothesis 2, and it was found that there was a significant difference between kindergarten boys and first grade boys in their ability to identify coins by name ($p=0.0001$), to identify the value of coins ($p=0.0099$), and to determine the equivalent values of coins ($p=0.0027$). The first grade boys consistently outscored the kindergarten boys on these three subtests. There was no significant difference between kindergarten boys and first grade boys in their ability to identify coins as money ($p=0.1000$).

Hypothesis 3: There was no significant difference between kindergarten girls and first grade girls in their responses to the four tasks of the Monetary Concepts Task Test: (a) to identify coins as money, (b) to identify coins by name, (c) to identify the value of coins, and (d) to determine equivalent values of coins.

Based upon the data which were examined for Hypothesis 3, there was a significant difference found between kindergarten girls and first grade girls in their ability to identify coins as money ($p=0.0165$), to identify coins by name ($p=0.0001$), to identify the value of coins ($p=0.0070$), and to determine the equivalent values of coins ($p=0.0100$). First grade girls consistently outscored kindergarten girls in each subtest area.

Hypothesis 4: There was no significant difference between kindergarten boys and kindergarten girls in their responses to the four tasks of the Monetary Concepts Task Test: (a) to identify coins as money, (b) to identify coins by name, (c) to identify the value of coins, and (d) to determine equivalent values of coins.

Upon examination of the data, it was noted that there was no significant difference between kindergarten boys and kindergarten girls in their ability to identify coins as money ($p=0.7975$), to identify coins by name ($p=0.9658$), and to determine the equivalent values of coins ($p=0.9646$). There was a significant difference between kindergarten boys and kindergarten girls in their ability to identify the value of coins ($p=0.0078$). The boys scored significantly higher than the girls at the kindergarten level in their ability to identify the value of coins.

Hypothesis 5: There was no significant difference between first grade boys and first grade girls in their responses to the four tasks of the Monetary Concepts Task Test: (a) to identify coins as money, (b) to identify coins by name, (c) to identify the value of coins, and (d) to determine equivalent values of coins.

The data were examined for Hypothesis 5, and it was found that there was no significant difference between first grade boys and first grade girls in their ability to identify coins as money ($p=0.1457$), to identify coins by name ($p=0.0564$), and to determine the equivalent values of coins ($p=0.3143$). There was a significant difference between first grade boys and first grade girls in their ability to identify the value of coins ($p=0.0187$). The first grade boys scored significantly higher than first grade girls in their ability to identify the value of coins.

CHAPTER V

SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

This study was designed to compare the responses of kindergarten and first grade children to the four tasks on the Monetary Concepts Task Test developed by McCarty (1967). It tested the hypothesis that there was no significant difference between the monetary concepts of kindergarten children and first grade children.

The subjects for this study were 96 kindergarten children and 93 first grade children enrolled in the Pawhuska Public Schools. Data were obtained during the fall semester, 1985.

The investigator followed procedures developed by McCarty (1967) for use of the four monetary concept tasks which were: Test I--Money Sorting Task; Test II--Coin Identification Task; Test III--Comparative Value Task; and Test IV--Equivalent Value Task.

The data were reported by number of correct responses. A t-test analysis was utilized to compare the responses of kindergarten children and first grade children, of kindergarten boys and first grade boys, of kindergarten girls and first grade girls, of kindergarten boys and kindergarten girls, and of first grade boys and first grade girls to the four tasks on the Monetary Concepts Task Test.

Findings

Based upon an analysis of the data, the findings from this study were as follows:

(1) First grade children were significantly more advanced than kindergarten children in their ability to identify coins as money.

(2) First grade children were significantly more advanced than kindergarten children in their ability to identify coins by name.

(3) First grade children were significantly more advanced than kindergarten children in their responses to the comparative value tasks.

(4) First grade children were significantly more advanced than kindergarten children in their responses to the equivalent value task section.

(5) There was no significant difference between kindergarten boys and first grade boys in their ability to identify coins as money.

(6) First grade boys were significantly more advanced than first grade girls in their ability to identify the value of coins.

(7) Kindergarten boys were significantly more advanced than kindergarten girls in their ability to identify the value of coins.

(8) There were no significant differences between kindergarten boys and kindergarten girls in their ability to identify coins as money, to identify coins by name, or to determine the equivalent values of coins.

(9) There were no significant differences between first grade boys and first grade girls in their ability to identify coins as money, to identify coins by name, or to determine the equivalent values of coins.

Additional Findings

The coin identification task on the Monetary Concepts Task Test was further analyzed (Appendix C) using Chi-square to determine whether subjects could identify a coin more accurately by name or by value. This analysis was completed to determine whether name or value was more frequently known and which of these might be more beneficial to curriculum on monetary concepts. The additional findings were:

(1) Kindergarten children were significantly more likely to identify a nickel by name than to identify it by value.

(2) Kindergarten children were significantly more likely to identify a dime by name than to identify it by value.

(3) There was no significant difference in the kindergarten children's ability to identify the penny, the quarter, or the half dollar by name or value.

(4) First grade children were significantly more likely to identify a dime by name than to identify it by value.

(5) First grade children were significantly more likely to identify a quarter by name than to identify it by value.

(6) There was no significant difference in the first graders' ability to identify the penny, the nickel, or the half dollar by name or value.

Implications

The data from this study suggested the following implications:

(1) Since there was a significant difference on only one area of the Monetary Concepts Task Test, separate curriculums for kindergarten boys and kindergarten girls would not be justified.

(2) Since there was a significant difference on only one area of the Monetary Concepts Task Test, separate curriculums for first grade boys and first grade girls would not be justified.

(3) First grade girls were more knowledgeable than kindergarten girls in their understanding of monetary concepts. The same trend was demonstrated between kindergarten boys and first grade boys. These findings justify the need for different curriculum for first grade children and kindergarten children.

Recommendations for Further Research

The following suggestions for further research are made on the basis of the findings of this study:

(1) Educators should examine the math curriculum to determine what monetary concepts are being taught as well as what should be included in the kindergarten and first grade programs.

(2) The teachers of preschool and primary age children need to include concrete experiences in the handling of money as a part of their math curriculum.

(3) Similar studies need to be conducted with older children to determine their levels of understanding of monetary concepts.

(4) The present math curriculum needs to be re-evaluated to determine if it is consistent with the levels of knowledge of monetary concepts of older elementary children.

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APPENDIXES

APPENDIX A

SCORE SHEET

SCORE SHEET

NAME _____

AGE _____

DATE _____

TEST I--MONEY-SORTING TASK

50	25	10	5	1	1	p50	p25	p10	VT	p5	p1	MC
----	----	----	---	---	---	-----	-----	-----	----	----	----	----

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	

Half										
Dollar	Quarter	Dime	Nickel	Penny	50	25	10	5	1	

*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		

APPENDIX B

NUMBER OF CORRECT RESPONSES

NUMBER OF CORRECT RESPONSES OF FIRST GRADE CHILDREN

No.	Sex	T1	T2	T3	T4	P	14	N	54	D	104	Q	254	HD	504
4.1	M	11	3	18	0	2	2	0	1	1	0	0	0	0	2
4.2	M	10	8	20	2	2	2	2	2	2	2	2	1	2	1
4.3	M	13	5	17	2	2	1	2	0	2	0	2	0	2	1
4.4	M	10	6	16	0	2	0	2	2	2	1	2	1	2	1
4.5	M	13	5	18	0	2	2	1	2	2	0	0	0	2	0
4.6	M	12	4	16	0	2	1	2	0	2	0	2	0	1	0
4.7	M	11	2	17	0	2	0	1	2	1	0	0	0	1	1
4.8	F	13	10	20	3	2	2	2	2	2	2	2	2	2	2
4.9	F	10	10	18	2	2	2	2	2	2	2	2	2	2	2
4.10	F	10	3	17	0	2	0	0	1	2	0	1	0	2	0
4.11	F	11	5	18	0	2	2	2	0	2	1	0	0	2	0
4.12	F	10	7	18	1	2	1	2	2	2	2	2	0	2	0
4.13	F	12	4	16	2	2	0	2	1	2	0	0	2	0	0
4.14	F	11	6	19	0	2	0	2	1	2	2	1	2	2	1
4.15	F	12	4	18	0	2	0	2	1	2	0	1	0	2	0
4.16	F	12	6	18	1	2	1	2	1	2	2	2	2	1	1
4.17	F	12	2	16	0	2	0	1	1	1	0	1	1	2	1
4.18	F	10	2	16	0	2	0	0	2	1	0	1	0	0	0
4.19	F	12	5	13	0	2	2	2	1	2	0	1	1	2	1
5.1	M	13	5	18	0	2	1	2	0	2	0	2	0	2	0
5.2	M	11	8	18	1	2	2	2	2	2	2	2	0	2	0
5.3	M	10	7	18	0	2	2	2	1	2	2	1	0	2	2
5.4	M	11	3	18	0	2	1	2	0	2	1	0	1	1	1
5.5	M	11	2	16	0	2	0	1	1	0	1	0	0	2	1
5.6	M	13	1	18	0	1	0	0	0	0	0	1	1	2	0
5.7	M	11	1	17	0	2	1	0	1	0	0	1	0	0	1
5.8	M	13	10	20	2	2	2	2	2	2	2	2	2	2	2
5.9	F	11	2	8	0	2	0	1	1	1	0	1	0	2	1
5.10	F	13	5	18	0	2	0	2	2	2	0	1	0	2	0
5.11	F	12	3	16	0	2	0	2	0	1	0	1	0	2	0
5.12	F	12	2	16	0	2	0	1	1	0	0	2	1	1	0
5.13	F	11	3	18	0	2	0	1	1	1	0	2	1	1	2
5.14	F	11	3	18	0	2	1	0	1	0	2	1	0	2	1
5.15	F	12	6	19	0	2	2	2	2	1	2	1	1	2	0
5.16	F	12	7	18	1	2	2	2	0	2	1	2	1	2	2
5.17	F	13	8	17	1	2	2	2	2	2	2	2	1	2	1
5.18	F	13	1	14	1	2	0	0	1	1	0	1	1	0	0
5.19	F	10	3	17	0	2	0	2	2	1	0	0	0	1	0
5.20	M	13	4	18	1	2	2	2	1	2	0	0	0	0	0
6.1	M	11	5	18	1	2	1	1	1	2	2	2	0	2	0
6.2	M	10	3	15	0	2	0	1	2	0	0	0	1	2	0
6.3	M	10	4	15	0	2	1	1	2	2	1	0	0	2	0
6.4	M	11	5	18	0	2	0	2	2	2	2	0	0	1	0
6.5	M	12	5	11	0	2	0	2	0	2	1	2	0	2	0
6.6	M	10	3	10	0	2	0	1	0	0	0	2	0	2	0
6.7	M	10	3	18	0	2	2	0	1	1	1	1	0	2	0
6.8	M	13	6	18	0	2	1	2	2	2	0	2	1	2	0
6.9	M	12	5	18	1	2	1	2	1	2	1	2	1	2	1
6.10	M	11	9	18	2	2	2	2	2	2	2	2	2	2	1
6.11	M	11	6	18	1	2	2	0	2	0	2	0	2	2	0
6.12	F	11	5	10	0	2	0	1	2	2	2	1	0	2	0
6.13	F	10	3	17	0	2	1	2	0	1	1	1	0	2	0
6.14	F	13	3	18	0	2	0	1	1	2	0	0	2	0	1
6.15	F	13	5	18	0	2	0	2	1	2	0	2	0	2	0
6.16	F	10	4	16	0	2	0	2	1	2	0	0	0	2	0
6.17	F	10	3	16	1	2	0	1	2	2	0	1	1	1	0
6.18	F	13	2	13	0	2	1	1	2	0	0	0	0	0	0

FIRST GRADE(continued)

No.	Sex	T1	T2	T3	T4	P	1¢	N	5¢	D	10¢	Q	25¢	HD	50¢
6.19	F	11	5	17	0	2	0	2	0	2	0	2	0	2	0
6.20	F	12	9	13	0	2	2	2	2	2	2	2	2	2	1
7.1	M	11	3	18	0	2	2	0	0	1	0	1	0	2	0
7.2	M	11	7	18	1	2	2	2	1	1	1	2	2	2	2
7.3	M	11	3	18	0	2	1	1	0	1	1	2	1	2	0
7.4	M	12	9	18	3	2	2	2	2	2	2	2	1	2	2
7.5	M	11	9	20	4	2	2	2	2	2	2	2	2	2	1
7.6	M	10	4	18	0	2	0	2	0	2	0	2	0	1	0
7.7	M	10	5	18	0	2	1	0	2	2	2	0	1	2	0
7.8	M	11	2	18	1	0	2	0	0	2	0	1	0	1	0
7.9	M	11	6	16	0	2	2	2	1	2	0	2	1	2	0
7.10	M	11	7	18	0	2	1	2	2	2	2	2	1	2	0
7.11	M	11	3	18	0	2	0	1	0	2	2	0	0	0	1
7.12	M	10	8	16	0	2	0	2	2	2	0	2	2	2	2
7.13	F	13	6	18	0	2	2	2	2	2	0	1	1	2	0
7.14	F	11	2	16	0	2	0	1	2	1	0	1	0	1	0
7.15	F	13	2	16	0	2	0	0	1	2	0	1	0	0	1
7.16	F	11	2	18	0	2	0	1	1	1	0	1	0	2	0
7.17	F	13	5	18	2	2	1	2	0	2	1	2	1	2	0
7.18	F	13	6	18	0	2	0	2	0	2	0	2	0	2	2
7.19	F	10	5	18	0	2	0	2	2	1	0	2	1	2	0
7.20	F	11	2	18	0	2	0	1	0	1	2	1	0	1	0
7.21	F	11	1	9	0	2	0	1	1	1	0	0	0	1	0
8.1	M	10	1	18	0	2	0	1	0	0	0	0	0	0	0
8.2	M	12	8	18	0	2	2	2	2	2	2	2	1	2	0
8.3	M	10	3	17	0	2	0	2	0	2	1	0	0	0	0
8.4	M	13	8	18	0	2	2	2	2	2	2	2	1	2	1
8.5	M	11	8	18	0	2	2	2	2	2	2	2	1	2	1
8.6	M	13	10	20	3	2	2	2	2	2	2	2	2	2	2
8.7	M	12	7	18	0	2	2	2	2	2	0	2	1	2	1
8.8	F	10	1	17	0	2	0	0	1	1	0	0	1	0	0
8.9	F	11	2	16	0	2	0	0	2	0	1	1	0	1	1
8.10	F	13	9	18	2	2	2	2	2	2	2	2	2	2	1
8.11	F	13	3	13	0	2	0	2	1	2	0	1	0	0	0
8.12	F	11	4	11	0	2	2	1	1	2	0	0	2	1	1
8.13	F	13	2	17	0	2	0	1	2	1	0	1	0	0	0

T1 - Task 1--Money Sorting Task

T2 - Task 2--Coin Identification Task

T3 - Task 3--Comparative Value Task

T4-- Task 4--Equivalent Value Task

Columns P - 50¢ represents the number correct on the coin identification task.

P - Penny

1¢ - One Cent

N - Nickel

5¢ - Five Cents

D - Dime

10¢ - Ten Cents

Q - Quarter

25¢ - Twenty-five Cents

HD - Half Dollar

50¢ - Fifty Cents

NUMBER OF CORRECT RESPONSES OF KINDERGARTEN CHILDREN

No.	Sex	T1	T2	T3	T4	P	1+	2	5+	D	10+	2	25+	HD	50+
1.1	F	11	4	18	0	2	0	2	1	2	1	1	0	2	1
1.2	F	11	2	16	0	2	1	0	0	1	0	0	0	2	0
1.3	M	11	3	18	0	2	0	2	1	1	1	0	0	2	1
1.4	F	11	1	15	0	2	0	0	1	1	0	0	0	1	1
1.5	M	10	1	17	0	2	0	0	0	1	0	0	1	0	0
1.6	F	11	0	10	0	1	0	1	0	0	0	0	0	0	0
1.7	F	12	5	13	0	2	0	2	2	2	0	0	0	2	0
1.8	F	10	1	15	0	2	0	1	0	0	0	0	0	1	0
1.9	F	11	1	17	0	2	0	0	0	0	0	0	0	0	0
1.10	M	12	9	20	1	2	2	2	2	2	2	2	2	2	1
1.11	M	10	0	15	0	1	1	1	1	0	0	0	1	1	1
1.12	M	13	5	14	0	2	1	0	0	2	2	2	1	2	0
1.13	M	13	1	15	0	2	0	1	0	1	0	0	0	1	0
1.14	M	11	6	18	0	2	2	2	2	2	2	0	0	0	0
1.15	F	11	3	17	0	2	2	1	0	2	1	0	1	0	0
1.16	F	12	3	17	0	2	2	1	1	2	0	0	0	1	0
1.17	M	11	2	18	0	2	0	1	1	2	0	1	0	0	0
1.18	F	11	0	9	0	1	1	0	1	0	0	0	0	0	0
1.19	M	11	0	17	0	1	0	1	0	0	1	1	0	1	0
1.20	M	12	4	16	0	2	2	1	2	1	2	1	1	0	1
1.21	M	11	2	15	0	2	1	0	0	1	0	2	0	1	0
1.22	M	13	2	17	0	2	1	0	0	2	1	1	0	1	1
1.23	F	9	2	15	0	2	0	0	0	0	2	0	0	0	1
1.24	M	11	2	18	0	2	1	1	0	1	1	1	1	2	0
1.25	F	11	1	9	0	0	0	1	0	0	0	1	0	2	0
1.26	F	12	1	16	0	2	0	1	0	0	0	1	0	0	0
1.27	F	10	1	9	0	2	1	0	1	1	1	1	1	0	0
1.28	M	10	1	17	0	2	0	0	0	0	0	0	1	0	0
1.29	M	10	0	16	2	1	0	0	1	0	0	0	0	0	1
1.30	F	11	1	11	0	2	0	0	1	0	0	0	0	1	0
1.31	M	10	1	13	0	2	0	1	1	1	0	1	1	0	0
2.1	M	11	2	18	0	2	1	0	1	1	0	0	0	2	1
2.2	M	11	2	18	0	2	0	0	1	0	0	0	0	2	1
2.3	M	11	3	14	0	2	1	0	2	1	0	1	0	2	0
2.4	M	12	3	16	0	2	0	2	0	0	0	0	0	1	2
2.5	M	11	3	18	0	2	0	0	1	1	0	0	0	2	2
2.6	M	10	1	10	0	1	2	0	0	1	0	0	1	0	1
2.7	M	11	0	16	0	1	0	0	1	0	1	0	1	0	0
2.8	M	10	2	16	0	1	0	0	0	0	0	0	2	2	0
2.9	M	12	3	18	0	2	0	1	1	1	0	2	0	2	0
2.10	M	10	1	20	0	2	1	0	0	0	1	1	1	1	0
2.11	M	12	1	17	0	2	0	1	0	1	0	0	1	1	0
2.12	M	13	7	16	0	2	0	2	2	2	2	2	0	2	0
2.13	M	10	3	18	0	2	0	1	0	2	2	0	0	0	0
2.14	M	10	1	18	0	2	0	1	0	0	0	0	0	0	0
2.15	M	11	1	15	0	2	0	0	0	1	1	0	0	1	1
2.16	F	13	5	16	0	2	1	2	1	2	0	2	0	2	1
2.17	F	11	4	18	0	2	2	1	2	0	2	0	0	0	0
2.18	F	12	3	18	0	2	0	2	1	2	0	0	0	0	1
2.19	F	10	0	15	0	1	1	0	1	0	0	0	1	0	0
2.20	F	11	4	8	0	2	1	2	1	2	1	2	1	1	1
2.21	F	11	1	14	0	2	0	1	1	1	1	0	1	0	0
2.22	F	11	1	12	0	2	0	0	0	1	0	0	1	0	0
2.23	F	12	5	19	0	2	1	2	2	2	0	0	0	0	2
2.24	F	11	3	12	0	2	0	2	2	0	0	0	0	1	0
2.25	F	11	5	12	0	2	2	1	2	0	0	2	0	2	0
2.26	F	11	2	14	0	2	0	0	1	2	0	0	0	0	1
2.27	F	11	0	16	1	1	0	1	0	1	0	0	0	1	0

KINDERGARTEN (continued)

No.	Sex	T1	T2	T3	T4	P	1¢	N	5¢	D	10¢	Q	25¢	HD	50¢
2.28	F	8	1	11	0	1	0	2	1	0	0	0	0	1	0
2.29	F	11	3	16	0	2	1	0	0	2	0	0	0	2	0
2.30	F	12	4	18	1	2	1	2	0	2	1	1	0	0	2
2.31	F	9	1	18	1	2	0	1	1	0	1	0	0	0	0
2.32	F	11	2	18	0	2	0	0	1	0	0	0	1	2	0
3.1	M	11	1	18	0	2	0	0	1	1	1	1	1	1	0
3.2	M	12	3	19	0	2	0	2	1	1	1	0	2	0	1
3.3	M	11	1	13	0	2	1	1	0	1	0	0	0	0	0
3.4	M	10	1	16	0	2	0	1	0	0	0	0	1	0	0
3.5	M	10	2	15	0	2	0	2	1	1	0	0	1	0	1
3.6	M	11	4	18	0	2	0	2	0	2	0	0	0	2	1
3.7	M	11	2	17	0	2	1	1	1	0	0	0	0	2	0
3.8	M	11	1	19	0	2	1	1	1	1	0	0	0	1	0
3.9	M	11	0	11	0	0	0	1	0	1	1	0	1	0	0
3.10	M	11	2	18	0	2	1	1	1	2	0	0	0	0	0
3.11	M	10	1	18	0	2	1	1	0	1	0	0	0	0	1
3.12	M	10	4	18	0	2	2	0	0	2	1	1	1	2	0
3.13	M	11	3	9	0	2	1	1	0	2	0	1	0	2	1
3.14	M	11	1	11	0	2	0	1	0	1	0	0	1	0	0
3.15	M	10	2	14	0	2	0	1	0	0	1	2	1	0	0
3.16	M	7	0	16	0	0	0	1	1	0	1	0	1	0	0
3.17	F	13	1	16	0	2	0	1	0	0	0	0	0	0	1
3.18	F	12	1	16	0	2	0	0	1	0	0	0	0	0	0
3.19	F	11	2	14	0	2	0	0	0	1	0	2	0	1	0
3.20	F	12	4	16	0	2	2	2	0	1	0	0	1	2	0
3.21	F	11	1	16	0	1	0	1	1	1	2	0	0	0	0
3.22	F	5	1	10	0	2	0	1	0	0	1	1	0	1	0
3.23	F	12	3	18	0	2	0	0	0	2	2	1	1	1	1
3.24	F	8	2	18	0	2	0	1	0	2	0	1	1	0	1
3.25	F	10	6	18	0	2	2	0	2	2	1	0	0	2	2
3.26	F	10	0	11	0	0	0	1	0	0	0	0	0	1	0
3.27	F	11	2	11	0	2	0	2	1	1	0	1	0	1	0
3.28	F	11	2	18	0	2	0	2	0	0	0	0	0	0	0
3.29	F	12	1	9	0	2	0	1	0	1	1	0	0	0	0
3.30	F	13	5	16	0	2	1	2	1	2	0	2	0	2	1
3.31	F	13	2	18	0	2	1	0	1	0	1	0	2	0	0
3.32	F	12	1	18	0	2	1	0	0	0	0	0	1	1	1
3.33	F	11	1	13	0	2	0	1	0	0	1	0	1	0	0

T1 - Task 1--Money Sorting Task

T2 - Task 2--Coin Identification Task

T3 - Task 3--Comparative Value Task

T4 - Task 4--Equivalent Value Task

Columns P - 50¢ represents the number correct on the coin identification task.

P - Penny

1¢ - One Cent

N - Nickel

5¢ - Five Cents

D - Dime

10¢ - Ten Cents

Q - Quarter

25¢ - Twenty-five Cents

HD - Half Dollar

50¢ - Fifty Cents

APPENDIX C
ANALYSIS OF COIN
IDENTIFICATION TASK

GRADE=KINDERGARTEN

TABLE OF P BY ONE

P(PENNY)		ONE(1¢)	
FREQUENCY	WRONG	RIGHT	TOTAL
EXPECTED			
PERCENT			
ROW PCT			
COL PCT			
WRONG	15	1	16
	14.2	1.8	
	15.63	1.04	16.67
	93.75	6.25	
	17.65	9.09	
RIGHT	70	10	80
	70.8	9.2	
	72.92	10.42	83.33
	87.50	12.50	
	82.35	90.91	
TOTAL	85	11	96
	88.54	11.46	100.00

STATISTICS FOR TABLE OF P BY ONE

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.513	0.474
LIKELIHOOD RATIO CHI-SQUARE	1	0.586	0.444
CONTINUITY ADJ. CHI-SQUARE	1	0.082	0.774
MANTEL-HAENSZEL CHI-SQUARE	1	0.508	0.476
FISHER'S EXACT TEST (1-TAIL)			0.418
(2-TAIL)			0.684
PHI		0.073	
CONTINGENCY COEFFICIENT		0.073	
CRAMER'S V		0.073	

SAMPLE SIZE = 96

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

GRADE=1ST GRADE

TABLE OF P BY ONE

P(PENNY)		ONE(1¢)	
FREQUENCY	WRONG	RIGHT	TOTAL
EXPECTED			
PERCENT			
ROW PCT			
COL PCT			
WRONG	1	1	2
	1.3	0.7	
	1.08	1.08	2.15
	50.00	50.00	
	1.64	3.13	
RIGHT	60	31	91
	59.7	31.3	
	64.52	33.33	97.85
	65.93	34.07	
	98.36	96.88	
TOTAL	61	32	93
	65.59	34.41	100.00

STATISTICS FOR TABLE OF P BY ONE

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.220	0.639
LIKELIHOOD RATIO CHI-SQUARE	1	0.209	0.647
CONTINUITY ADJ. CHI-SQUARE	1	0.000	1.000
MANTEL-HAENSZEL CHI-SQUARE	1	0.218	0.641
FISHER'S EXACT TEST (1-TAIL)			0.572
(2-TAIL)			1.000
PHI		-0.049	
CONTINGENCY COEFFICIENT		0.049	
CRAMER'S V		-0.049	

SAMPLE SIZE = 93

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

IDENTIFYING COINS - BY GRADES

GRADE=KINDERGARTEN

TABLE OF N BY FIVE

N(NICKEL)	FIVE(5¢)		TOTAL
	WRONG	RIGHT	
FREQUENCY	70	5	75
EXPECTED	66.4	8.6	
PERCENT	72.92	5.21	78.13
ROW PCT	93.33	6.67	
COL PCT	82.35	45.45	
WRONG			
RIGHT	15	6	21
	18.6	2.4	
	15.63	6.25	21.88
	71.43	28.57	
	17.65	54.55	
TOTAL	85	11	96
	88.54	11.46	100.00

STATISTICS FOR TABLE OF N BY FIVE

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.759	0.005
LIKELIHOOD RATIO CHI-SQUARE	1	6.484	0.011
CONTINUITY ADJ. CHI-SQUARE	1	5.750	0.016
MANTEL-HAENSZEL CHI-SQUARE	1	7.678	0.006
FISHER'S EXACT TEST (1-TAIL)			0.012
(2-TAIL)			0.012
PHI		0.284	
CONTINGENCY COEFFICIENT		0.273	
CRAMER'S V		0.284	

SAMPLE SIZE = 96

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

IDENTIFYING COINS - BY GRADES

GRADE=1ST GRADE

TABLE OF N BY FIVE

N(NICKEL)	FIVE(5¢)		TOTAL
	WRONG	RIGHT	
FREQUENCY	26	13	39
EXPECTED	22.2	16.8	
PERCENT	27.96	13.98	41.94
ROW PCT	66.67	33.33	
COL PCT	49.06	32.50	
WRONG			
RIGHT	27	27	54
	30.8	23.2	
	29.03	29.03	58.06
	50.00	50.00	
	50.94	67.50	
TOTAL	53	40	93
	56.99	43.01	100.00

STATISTICS FOR TABLE OF N BY FIVE

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	2.566	0.109
LIKELIHOOD RATIO CHI-SQUARE	1	2.594	0.107
CONTINUITY ADJ. CHI-SQUARE	1	1.931	0.165
MANTEL-HAENSZEL CHI-SQUARE	1	2.539	0.111
FISHER'S EXACT TEST (1-TAIL)			0.082
(2-TAIL)			0.139
PHI		0.166	
CONTINGENCY COEFFICIENT		0.164	
CRAMER'S V		0.166	

SAMPLE SIZE = 93

IDENTIFYING COINS - BY GRADES

GRADE=KINDERGARTEN

TABLE OF D BY TEN

D(DIME)	TEN(10¢)		
FREQUENCY EXPECTED PERCENT ROW PCT COL PCT	WRONG	RIGHT	TOTAL
WRONG	66 62.7 68.75 94.29 76.74	4 7.3 4.17 5.71 40.00	70 72.92
RIGHT	20 23.3 20.83 76.92 23.26	6 2.7 6.25 23.08 60.00	26 27.08
TOTAL	86 89.58	10 10.42	96 100.00

STATISTICS FOR TABLE OF D BY TEN

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.125	0.013
LIKELIHOOD RATIO CHI-SQUARE	1	5.400	0.020
CONTINUITY ADJ. CHI-SQUARE	1	4.405	0.036
MANTEL-HAENSZEL CHI-SQUARE	1	6.061	0.014
FISHER'S EXACT TEST (1-TAIL)			0.022
(2-TAIL)			0.022
PHI		0.253	
CONTINGENCY COEFFICIENT		0.245	
CRAMER'S V		0.253	

SAMPLE SIZE = 96

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

IDENTIFYING COINS - BY GRADES

GRADE=1ST GRADE

TABLE OF D BY TEN

D(DIME)	TEN(10¢)		
FREQUENCY EXPECTED PERCENT ROW PCT COL PCT	WRONG	RIGHT	TOTAL
WRONG	29 22.7 31.18 87.88 45.31	4 10.3 4.30 12.12 13.79	33 35.48
RIGHT	35 41.3 37.63 58.33 54.69	25 18.7 26.88 41.67 86.21	60 64.52
TOTAL	64 68.82	29 31.18	93 100.00

STATISTICS FOR TABLE OF D BY TEN

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.661	0.003
LIKELIHOOD RATIO CHI-SQUARE	1	9.544	0.002
CONTINUITY ADJ. CHI-SQUARE	1	7.339	0.007
MANTEL-HAENSZEL CHI-SQUARE	1	8.568	0.003
FISHER'S EXACT TEST (1-TAIL)			0.002
(2-TAIL)			0.004
PHI		0.305	
CONTINGENCY COEFFICIENT		0.292	
CRAMER'S V		0.305	

SAMPLE SIZE = 93

IDENTIFYING COINS - BY GRADES

GRADE=KINDERGARTEN

TABLE OF Q BY TWOFIVE

Q(QUARTER)	TWOFIVE(25¢)		
FREQUENCY EXPECTED PERCENT ROW PCT COL PCT	WRONG	RIGHT	TOTAL
WRONG	82	3	85
	81.5	3.5	
	85.42	3.13	88.54
	96.47	3.53	
	89.13	75.00	
RIGHT	10	1	11
	10.5	0.5	
	10.42	1.04	11.46
	90.91	9.09	
	10.87	25.00	
TOTAL	92	4	96
	95.83	4.17	100.00

STATISTICS FOR TABLE OF Q BY TWOFIVE

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.754	0.385
LIKELIHOOD RATIO CHI-SQUARE	1	0.596	0.440
CONTINUITY ADJ. CHI-SQUARE	1	0.004	0.947
MANTEL-HAENSZEL CHI-SQUARE	1	0.747	0.388
FISHER'S EXACT TEST (1-TAIL)			0.390
(2-TAIL)			0.390
PHI		0.089	
CONTINGENCY COEFFICIENT		0.088	
CRAMER'S V		0.089	

SAMPLE SIZE = 96

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

IDENTIFYING COINS - BY GRADES

GRADE=1ST GRADE

TABLE OF Q BY TWOFIVE

Q(QUARTER)	TWOFIVE(25¢)		
FREQUENCY EXPECTED PERCENT ROW PCT COL PCT	WRONG	RIGHT	TOTAL
WRONG	47	5	52
	43.1	8.9	
	50.54	5.38	55.91
	90.38	9.62	
	61.04	31.25	
RIGHT	30	11	41
	33.9	7.1	
	32.26	11.83	44.09
	73.17	26.83	
	38.96	68.75	
TOTAL	77	16	93
	82.80	17.20	100.00

STATISTICS FOR TABLE OF Q BY TWOFIVE

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	4.769	0.029
LIKELIHOOD RATIO CHI-SQUARE	1	4.786	0.029
CONTINUITY ADJ. CHI-SQUARE	1	3.637	0.057
MANTEL-HAENSZEL CHI-SQUARE	1	4.718	0.030
FISHER'S EXACT TEST (1-TAIL)			0.028
(2-TAIL)			0.050
PHI		0.226	
CONTINGENCY COEFFICIENT		0.221	
CRAMER'S V		0.226	

SAMPLE SIZE = 93

IDENTIFYING COINS - BY GRADES

GRADE=KINDERGARTEN

TABLE OF HD BY FIVEZERO

HD(HALF DOLLAR)		FIVEZERO(50¢)	
FREQUENCY EXPECTED PERCENT ROW PCT COL PCT	WRONG	RIGHT	TOTAL
WRONG	67	3	70
	66.4	3.6	
	69.79	3.13	72.92
	95.71	4.29	
	73.63	60.00	
RIGHT	24	2	26
	24.6	1.4	
	25.00	2.08	27.08
	92.31	7.69	
	26.37	40.00	
TOTAL	91	5	96
	94.79	5.21	100.00

STATISTICS FOR TABLE OF HD BY FIVEZERO

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.446	0.504
LIKELIHOOD RATIO CHI-SQUARE	1	0.413	0.520
CONTINUITY ADJ. CHI-SQUARE	1	0.023	0.880
MANTEL-HAENSZEL CHI-SQUARE	1	0.441	0.507
FISHER'S EXACT TEST (1-TAIL)			0.412
(2-TAIL)			0.610
PHI		0.068	
CONTINGENCY COEFFICIENT		0.068	
CRAMER'S V		0.068	

SAMPLE SIZE = 96

WARNING: 50% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

IDENTIFYING COINS - BY GRADES

GRADE=1ST GRADE

TABLE OF HD BY FIVEZERO

HD(HALF DOLLAR)		FIVEZERO(50¢)	
FREQUENCY EXPECTED PERCENT ROW PCT COL PCT	WRONG	RIGHT	TOTAL
WRONG	29	2	31
	27.0	4.0	
	31.18	2.15	33.33
	93.55	6.45	
	35.80	16.67	
RIGHT	52	10	62
	54.0	8.0	
	55.91	10.75	66.67
	83.87	16.13	
	64.20	83.33	
TOTAL	81	12	93
	87.10	12.90	100.00

STATISTICS FOR TABLE OF HD BY FIVEZERO

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	1.722	0.189
LIKELIHOOD RATIO CHI-SQUARE	1	1.910	0.167
CONTINUITY ADJ. CHI-SQUARE	1	0.969	0.325
MANTEL-HAENSZEL CHI-SQUARE	1	1.704	0.192
FISHER'S EXACT TEST (1-TAIL)			0.163
(2-TAIL)			0.325
PHI		0.136	
CONTINGENCY COEFFICIENT		0.135	
CRAMER'S V		0.136	

SAMPLE SIZE = 93

WARNING: 25% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

VITA

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