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THE ROLE OF PARENTS AS FORMAL MATH INSTRUCTORS  
OF PREKINDERGARTEN CHILDREN

by

Monica Jane Blanch

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Family and Human Development

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## ABSTRACT

The Role of Parents as Formal Math Instructors  
of Prekindergarten Children

by

Monica Jane Blanch, Master of Science  
Utah State University, 2002

Major Professor: Dr. Ann M. Berghout Austin  
Department: Family and Human Development

This study was designed to explore the relationship between maternal attitudes about math, mothers' attitudes about their prekindergarten child's math abilities, mother-child math interactions, and prekindergarten children's math achievement. Using a Vygotskian framework, an intervention was developed. An intervention group of 18 mother-child dyads from Hyrum, Utah, area and a comparison group of 17 mother-child dyads from the Weston, Idaho, area were invited to participate in this research project. Measures included the Early Mathematics Concepts (EMC) assessment, the School Readiness Composite (SRC) of the Bracken Basic Concepts Scale-Revised (BBCS-R), My Attitudes Scale (MAS), and My Attitudes About My Child's Abilities Scale (MAAMCAS). Research hypotheses predicted that the intervention group would score higher on the EMC and each of the EMC's four focus areas at the posttest. Results did not support these hypotheses. Research hypotheses

also predicted that the intervention group would have a larger difference in MAS and MAAMCAS scores from pretest to posttest and that MAS and MAAMCAS scores would predict EMC scores. Neither of these hypotheses was supported. The final research hypothesis predicted a relationship between EMC focus area scores and math-related subscales of the BBCS-R. The strongest relationship appeared to be between the EMC number focus and the BBCS-R number subscale. The results were interpreted in accordance with current research and possible limitations of the present study.

(186 pages)

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Monica J. Blanch

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## CHAPTER I

### STATEMENT OF THE PROBLEM

We live in a time of extraordinary and accelerating change. New knowledge, tools, and ways of doing and communicating mathematics continue to emerge and evolve. Calculators, too expensive for common use in the early eighties, now are not only commonplace and inexpensive but vastly more powerful. Quantitative information available to limited numbers of people a few years ago is now widely disseminated through popular media outlets. The need to understand and be able to use mathematics in everyday life and in the workplace has never been greater and will continue to increase. (Carpenter & Gorg, 2000, p. 3)

As mathematics takes a more powerful role in the 21<sup>st</sup> century, educators, parents, and researchers ask how, when, and where they can best prepare children for the increased demand in mathematical ability. Currently, children's math preparation before school is often not sufficient (Case, Griffin, & Kelley, 1999). Children need experiences with formal math, which consists of the teaching of symbolism and established math procedures, and informal math, which consists of problem-solving with concrete objects wherein such activities are embedded in day-to-day routines. Formal and informal instruction in the home may provide children with a foundation from which to work when they are taught similar concepts in school settings (Ginsburg, Klein, & Starkey, 1997). To our knowledge, only one study has attempted to help parents teach formal and informal math in their home to their prekindergarten, 4- and 5-year-old children (Starkey & Klein, 2000). However, in contrast to the present work, Starkey and Klein's parent participants were low income and Mexican American or African American, and the parents in that study attended bi-weekly, structured activity classes with their prekindergarten children, but kept no record of the

number and type of parent-child math activities outside of class.

Perhaps one of the boldest stands on math development has been taken by the National Council of Teachers of Mathematics (NCTM; Carpenter & Gorg, 2000). NCTM established principles and standards of math achievement for preschool to 12th-grade children. Developing a positive math environment, learning through both formal and informal experiences, and problem-solving in everyday contexts are emphasized. Early mathematics experience is not just about preparing a child for school or accelerating them; it is about challenging children to explore math ideas and to feel comfortable and enthusiastic about mathematics usage (Carpenter & Gorg).

Application of Vygotskian theory offers a vehicle through which skills may be strengthened even at the most basic level. One vital Vygotskian concept, the zone of proximal development (ZPD), suggests that, with adult guidance, a child can reach a level beyond his/her actual development to one of potential development. When this concept is paired with formal instruction (another Vygotskian concept), parents can most effectively impact children's learning (Vygotsky, 1978).

Parents may not realize that many of the daily activities they do with children such as setting the table, a form of one-to-one correspondence, are math related (Ginsburg et al., 1997). The bulk of the math assistance parents give to young children is in counting and naming numbers (Anderson, 1997; Blevins-Knabe, Austin, Musun, Eddy, & Jones, 2000). Only one study to our knowledge has attempted to teach parents how to recognize and promote math activities in their interactions with their children, and this study did not measure the type or frequency of math

interactions in the home. Further, its findings are not as generalizable to a middle-class sample as is the present work (Starkey & Klein, 2000).

Parents' math attitudes may also contribute to children's achievement in mathematics. The definition of math attitudes may have an effect in identifying the role of math attitudes in a child's math achievement. A positive correlation has been identified between parents' math affect, defined as enjoying math, and the frequency of math activities in which children participate, yet, frequency of activities was not related to child's math achievement on the TEMA-2 (Blevins-Knabe et al., 2000). A significant correlation was also not found between how important mothers felt math was and math achievement on the TEMA-2. Young-Loveridge (1989) did find that the mother's high orientation toward math was related to whether the child scored high on the Number Tasks Interview. Unfortunately, this study was based on an interview of only six mothers. Four of the mothers had children who scored high on the Number Tasks Interview. The relationship between parents' attitude about math and parents' attitude about their children's ability to do math needs to be better understood. Additionally, how these attitudes are related to children's math achievement must also be better understood.

Few previous studies on children's math development have followed a true experimental design. Some studies on math development have relied on questionnaires, nonnaturalistic settings, or case studies to discover how parents interact mathematically with their children (Anderson, 1991, 1997; Leder, 1992; Phillips & Anderson, 1993). Other studies have used a correlational design to

understand how mathematical interactions and parents' math affect are related to children's math achievement (Blevins-Knabe, et al., 2000; Blevins-Knabe & Musun-Miller, 1996; Hasselbring & Moore, 1996; Musun-Miller & Blevins-Knabe, 1998). Klein and Starkey (2000) used a pre/post design to study the role of preschool math curriculum on children's math development. Starkey and Klein (2000) used a pre/post design in an intervention with Head Start mothers. Musun-Miller and Blevins-Knabe (1998) proposed an indirect relationship between parents' math affect, the frequency of math activities parents and children engage in together, and children's math achievement. This relationship is not explored further, but a true experimental design would clarify the relationship between children's math achievement, frequency of math activities in the home, and parents' math affect.

A variety of measures have been used to measure math affect and math achievement. The most common math affect assessment has been the Fennema-Sherman Math Attitudes Scales, which was originally developed for high school students (FSMAS; Mulhern & Rae, 1998). Nine scales comprise the FSMAS. The scales can be used individually, in groups, or in a complete set. FSMAS has been adapted to measure attitudes about English and physical education, but no study has adapted the FSMAS to identify parents' attitudes about their own math abilities or about their prekindergarten child's math development. The Math Anxiety Scale and Parent's Attitude About Their Child's Math Development Scale were adapted from a shortened form of the FSMAS by the present author to measure math attitudes among parents (Mulhern & Rae). These two new attitudes scales were called My Attitudes

Scale (MAS) and My Attitudes About My Child's Abilities Scale (MAAMCAS).

Math achievement has been measured using a variety of instruments. The Early Mathematics Concepts (EMC; Ashby, 1997) contains the core elements (measurement, number, pattern, shape, and space) of all the other tests and was used in the present study. The EMC lacks evidence of validity because the assessment scores have not been compared to scores on other tests (Ashby). The Bracken Basic Concept-Revised (BBCS-R; Bracken, 1998) scores for numbers/counting, sizes, comparisons, and shapes were compared to EMC scores in the present study to assess EMC validity. The BBCS-R was also used to conceal the focus of this study from the participants.

The purpose of this study was to address the impact of formal and informal math instruction in the home and the role of parental attitudes on children's math development through application of Vygotsky's theory. The following questions guided this study. Does parental instruction of math affect prekindergarten children's math performance? Are parents', or more specifically a mother's, attitudes about math and/or her attitudes about her child's ability to succeed in math related to the child's mathematical performance? Finally, is the EMC a valid measure to use to test prekindergarten children's math ability?

These questions were addressed using a quasi-experimental design. Pre- and posttests measured math affect using the MAS and MAAMCAS. Pre- and posttests measured math achievement using EMC and school readiness using the BBCS-R. Scores from the EMC were compared to subscales of the BBCS-R dealing with

number, sizes, comparisons, and shapes. The intervention group ( $N = 18$  mother-child dyads) received a parent training math intervention. The comparison group ( $N = 17$  mother-child dyads) received a parent training psychosocial intervention. Both groups were recruited through contact with leaders (bishops and Relief Society presidents) of The Church of Jesus Christ of Latter-day Saints in the Hyrum, Utah, area and Weston, Idaho, area.

The following hypotheses guided the research.

1. Following intervention, posttest total scores on the EMC (Ashby, 1997) were expected to be higher for the intervention group than for the comparison group.
2. Following intervention, posttest results in the EMC measurement focus were expected to be higher for the intervention group than for the comparison group.
3. Following intervention, posttest results in the EMC number focus were expected to be higher for the intervention group than for the comparison group.
4. Following intervention, posttest results in the EMC pattern focus were expected to be higher for the intervention group than for the comparison group.
5. Following intervention, posttest results in the EMC shape and space focus were expected to be higher for the intervention group than for the comparison group.
6. Following intervention, mothers in the intervention group were expected to have a larger change in scores from the pretest and posttest on the mathematics attitudes scales as measured by adaptations of the short form of the FSMAS (Fennema & Sherman, 1976; Mulhern & Rae, 1998) entitled My Attitudes Scale (MAS) and My Attitudes About My Child's Abilities Scale (MAAMCAS).

7. Mothers' mathematics attitudes scales as measured by adaptations of the short form of the FSMAS (Fennema & Sherman, 1976; Mulhern & Rae, 1998), entitled My Attitudes Scale (MAS) and My Attitudes About My Child's Abilities Scale (MAAMCAS), were expected to predict children's scores on the EMC.

8. Scores on SRC of the BBCS-R (Bracken, 1998), namely numbers/counting, sizes, comparisons, and shapes, were expected to be positively correlated with scores on the EMC.



## CHAPTER II

### REVIEW OF LITERATURE

The following section will review the literature regarding children's math development during the early childhood years with a specific emphasis in development of math activities in the home. This review will also highlight gaps in current literature in the area of children's math development in the home. First, mathematical reasoning will be addressed. Next, early childhood preparation in mathematics will be discussed. Strategies to promote mathematics proficiency during the early childhood years will be noted. Finally, children's math and parental math attitude assessment techniques will be addressed.

#### Mathematics Reasoning

This section will address the basics of mathematical reasoning. The emergence of mathematical thought will be identified. The mathematical concepts that constitute the domain of mathematics will be discussed. Finally, formal and informal math will be distinguished.

Mathematical thinking is as natural for humans as using tools or language. In fact, babies may be born with the ability to reason mathematically. With small sets, babies are able to enumerate and detect patterns. Children less than 2-years-old have the ability to add and subtract (Ginsburg et al., 1997). These basic skills, enumerating, detecting patterns, adding and subtracting, are some of the concepts comprising mathematical thought.

Descriptions of mathematics vary in the literature by the mathematical concepts that authors choose to include in the domain of mathematics. Some of the mathematical concepts are more specific than others, and others are broad and less specific. Ashby (1997), Charlesworth and Lind (1999), Marsden, Meisels, Jablon, and Dichtelmiller (1997), Ginsburg and Baroody (1990), Starkey and Klein (2000), and Klein and Starkey (2000) identified number and number relations as one mathematical concept. Ginsburg and Baroody (1990) focused mainly on number; they neglected to address pattern, measurement, space, and shape, which are included by Ashby (1997), Charlesworth and Lind (1999), Klein and Starkey (2000) and Marsden et al. (1997). Starkey and Klein (2000) included all but one of these categories; they failed to include measurement in their description of mathematics. Marsden and colleagues added a mathematical concept called "approach to mathematical thinking" which identifies precursors of math development. Charlesworth and Lind (1999) added mathematical concepts about parts and wholes and one-to-one correspondence, which are associated with numbers, number relationships, and patterns. Charlesworth and Lind (1999) additionally identified the role of language-concept formation, which corresponds with Ginsburg and Baroody's (1990) further categorizations of their mathematical concepts into two groups: formal math concepts and informal math concepts. As part of their description of mathematics, both Starkey and Klein (2000) and Klein and Starkey (2000) included a category called logical reasoning.

Ashby's (1997) mathematical concepts were used in this study. Not only are his core mathematical concepts consistent with Charlesworth and Lind (1999), Klein

and Starkey (2000), and Marsden et al. (1997), who view a definition of mathematics encompassing more than number, but Ashby's (1997) concepts are incorporated in a standardized assessment for 4- and 5-year-olds.

The terms *formal* and *informal* are associated with mathematics in various ways. Formal is used to describe direct teaching of mathematics (Graham, Nash, & Paul, 1997; Leder, 1992), and includes contexts where math symbolism and formal math terminology are discussed (English, 1998). It includes any math that involves symbols and established math procedures and is the primary focus of mathematics teaching in school (Huntsinger, Jose, Liaw, & Ching, 1997; Song & Ginsberg, 1987; Van Luit & Schopman, 2000). Informal math is inversely defined as math that is learned primarily outside of school through exploration, using concrete objects (Ginsburg et al., 1997).

For the purposes of this study, definitions of formal and informal math were taken directly from the literature as follows. Formal math "involves written symbolism, algorithms, and mathematical principles and constitutes the focus of primary mathematics instruction" (Song & Ginsburg, 1987, p. 1287). Informal math "is grounded in problem-solving situations with concrete objects, and children construct [informal math concepts] through their interactions with the physical and social world" (Ginsburg et al., 1997, p. 413).

Formal mathematical knowledge is built on informal knowledge. The relationship between formal and informal math is a cycle. As children gain informal knowledge, they build foundations for formal knowledge. As formal knowledge

increases, children are prepared for more advanced informal math (Ginsburg et al., 1997). These definitions of formal and informal math and Ashby's (1997) mathematical concepts of mathematic thinking were the standard by which the contents of the math intervention activities used in this study were determined. Through the use of multiple mathematical categories (e.g., shapes, patterns), a broader definition of mathematics, including more than counting and numerical operations, was emphasized.

#### Early Childhood School Readiness

The construct of "school readiness" has grown from a narrow perspective of a child's readiness to perform in a classroom to also encompass readiness to learn (Carlton & Winsler, 1999). No longer does school readiness fit in a paradigm where learning follows development as proposed by Gesell's maturational theory. Vygotsky leads current thought on school readiness with his theory that development follows learning, and environment and biology co-create development with an emphasis on scaffolding (Carlton & Winsler). School readiness within a Vygotskian framework then means that, in some environments with some level of support, all children can learn some things. For optimal learning, prekindergarten children, therefore, need to be exposed to a variety of situations carefully assisted by others (e.g., parents and preschool teachers) to learn important skills and concepts (Carlton & Winsler).

Although, as mentioned previously, children appear to have an awareness of number at an early age, their early childhood experiences may not be sufficient to

prepare them for school (Carpenter & Gorg, 2000). The developmental pathways through which skills are constructed, reorganized, and refined may differ between children who develop poor skills and those who develop good skills (Fischer & Bidell, 1998). These variations may be caused by cultural background, learning history, emotion, and/or learning style. Children who develop through alternative pathways, as defined by Fischer and Bidell, should not be viewed as delayed. Diverging pathways may produce the same goal through different means. Parents need to support children in their individualized pathway to avoid frustrations of forcing them onto a more "normal" pathway (Fischer & Bidell).

Various developmental pathways exist in children's math development (Ginsburg et al., 1998). Children who learn only informal mathematics before school have more difficulty with formal mathematics. One of the best examples of this phenomenon comes from the study of South American street vendors. The street vendor children have very little formal education, but, through invented strategies, these children are able to reason mathematically. Their knowledge of informal mathematics helps these children to outperform schooled children in ratio usage; but the street vendors are unable to perform as well as the schooled children in formal mathematics like adding and subtracting. These children are found to profit from school learning, but they do not need to depend on school learning to think mathematically in their everyday life. Informal experience alone does not prepare the street vendors to think mathematically in all mathematical categories (e.g., addition and subtraction) even though some mathematical categories (e.g., addition and

subtraction) are part of their everyday lives. Thus, informal experiences may be supported by formal experiences for optimal understanding. Vygotsky further emphasizes the role of formal experiences in learning through a cycle in which informal experiences build a foundation for formal experiences which opens the door to other informal experiences (Ginsburg et al.).

The role of informal math experiences is less clear in a study of U.S. and Korean children by Song and Ginsburg (1987). They found differences in informal and formal math performance between a U.S. and Korean sample. Three hundred and fifteen Korean children and 538 U.S. children were tested using the TEMA. The results suggest that at the 4- and 5-year-old range there are no differences in U.S. and Korean children's formal math knowledge, but U.S. children score significantly higher on informal math knowledge. By age 7 and 8, children in Korea outperform U.S. children in formal mathematics. Song and Ginsburg suggested that what Korean children lack in informal math knowledge, they compensate for through knowledgeable teachers and more time dedicated to math study. The study did not follow these children long enough to address whether Korean children's lack of exposure to informal math would affect further math development (Song & Ginsburg).

Types of early childhood experiences make a difference in performance in school (Carpenter & Gorg, 2000; Case et al., 1999; Ginsburg et al., 1997). By 2 ½ to 3 years old, children of contrasting socioeconomic status (SES) test at different mathematical levels. By kindergarten, high-SES children test a year and a half ahead of their low-SES peers (Case et al., 1999). These math ability differences may be due

to the contrasting early childhood experiences that children have that are linked to SES. High-SES children come to school with more mathematical knowledge than their low-SES peers. When low-SES children participate in an Early Head Start class before school, they come to school equally prepared to learn as the high-SES children (Case et al.).

Klein and Starkey (2000) found supporting evidence for the role of SES in math development. In what Klein and Starkey called the "Berkeley Math Readiness Project," five preschool classrooms serving middle-income families and five serving low-income families were invited to participate. The pre/post math intervention group was tested in the fall and in the spring. A comparison group who received no intervention was taken from the same preschool classrooms but from the previous year's students. These comparison students were tested only at the end of their school year in the spring. All the children were tested on the Child Math Assessment (CMA), which measures informal math knowledge in number, arithmetic, spatial/geometric knowledge, pattern knowledge, and measurement. The CMA was not standardized because it was developed specifically for this study (Klein & Starkey).

The intervention consisted of a preschool curriculum. Topic units were taught on enumeration and number sense, arithmetic reasoning, spatial sense, geometric reasoning, pattern sense and unit construction, logical reasoning, and nonstandard measurement. Math activities with concrete materials were used to teach each topic unit (Klein & Starkey, 2000).

The intervention group at the posttest showed more extensive knowledge than

the comparison group. When split by SES, the change in the scores from pre- to posttest was smaller for the middle-income participants than for the low-income participants. Additionally, the low-income intervention children scored similarly to the middle-income comparison group (Klein & Starkey, 2000). Therefore, preschool teachers may influence children's math development, but those influences may be mediated by SES.

Informal knowledge must be complemented with formal knowledge in children's early mathematical experiences to prepare the path for school learning (Gelman & Williams, 1998). As seen in South American street vendors, informal learning (which focuses on problem solving) is less effective without formal learning. On the other hand, formal school learning alone does not fully develop children's problem-solving skills (Case et al., 1999). The best form of learning allows the abstract, formal learning to be introduced alongside concrete, informal learning (Carpenter & Gorg, 2000). Everyday experiences before school open the door for formal and informal learning to promote problem-solving skills and prepare children to succeed in school (Gelman & Williams).

Hughes (1986) asserted that children have difficulty with mathematics in school because math language is unfamiliar and abstract. "Proficiency in the basic skills of numeracy is not enough. What is needed is the ability to apply these skills to real-life practical problems," stated Hughes (p. 10). Emphasizing this linkage, the National Council of Teachers of Mathematics (NCTM) has urged teachers to help children connect the language and conventions of formal mathematics to their informal



knowledge and language (Carpenter & Gorg, 2000).

Although children are participating in a variety of math experiences, they are few in comparison with their reading and social and play activities (Blevins-Knabe et al., 2000). Additionally, children may not understand the usefulness of math. Seventy-nine children in kindergarten through third grade were interviewed by Perlmutter, Bloom, Rose, and Rogers (1997). Each child met with the interviewer several times to develop rapport before answering a series of 12 questions about the child's perceptions of math and its uses. The children answered questions like, "What is math?" "Who uses math/numbers?" and "Why do you need to learn math?" Each interview was tape recorded then transcribed for the authors to analyze. One interesting finding was that children are positive about their math skills and math in general, but they are unaware of the real life uses of math, although children's understanding of adult uses of math did increase over the primary grades. These children know that math is important, but they are not sure why math is important. The link between formal math and informal math was missing.

In a study of parent-child math interactions, Anderson (1997) noted missing formal/informal math links. She asked parents of preschoolers to have four 15-minute math interaction sessions over the course of 2 days. Then, she recorded the types of math interactions of the 21 parents in this study. Surprisingly, only two of the parents in one of the four required math-interaction sessions connected their daily lives with the mathematical activity they were doing at the time. No other parents connected everyday life with the math activity they were doing at the time.

Another possible reason that families are not creating these links is that parents may have a tendency to solve children's problems for them. In a study of six mother-child pairs, Thompson and Hixson (1984) taught mothers how to encourage independent problem solving in their preschool children. Each mother-child pair was video taped solving problems in pre- and posttests. After five parent group sessions and three families receiving additional home visits, all the children improved in their problem-solving ability. Parents had encouraged their children to solve problems independently before the intervention, but they also more frequently solved the problems for the child before the intervention. This study is limited by a small sample ( $N = 6$ ) and no comparison group, but the study does offer some explanation for missing links between formal math and informal math in the home. Real-life problem solving can create that link as mentioned previously (Anderson, 1991; Hasselbring & Moore, 1996).

#### Strategies to Promote Mathematics Proficiency During Early Childhood

Very few studies examine the promotion of mathematics activities during early childhood for normally developing children and the linkage of these activities with math proficiency scores. This section will address the types of mathematics activities done in the early childhood environment. A discussion of math attitudes will follow. Finally, the link between math activities, math attitudes, and math achievement will be addressed.

Types of Mathematics Activities Done in  
the Early Childhood Environment

During early childhood, children learn in a variety of environments. Among the most studied environments are homes, preschools, and family day care facilities. Parents may not recognize that many of the activities they do with their children are math related (e.g., sorting or sequencing; Ginsburg et al., 1997). Phillips and Anderson (1993) conducted a case study with a 3 ½-year-old and a 6-year-old. This study suggested ways parents could enhance early mathematical learning. They suggested that parents could use math while reading to children at bedtime and while playing games with their children to enhance math in young children. Similar to Ginsburg et al., their rationale was that "parent-child interactions during everyday activity support and encourage early mathematical learning" (Phillips & Anderson, p. 145).

Anderson (1997), in her study on parent-child interactions in math, identified the types of mathematical activities that parents of 4-year-olds participate in with their children. Twenty-one parent-child dyads were asked to tape record four 15-minute math sessions over a 2-day period. These tapes were then coded to determine the types of mathematics activities in which children participated at home. The most common activity was counting, found in 55 out of 82 sessions. These findings support those of Blevins-Knabe and Musun-Miller (1996), who found that the most common number activity reported by the 40 mothers of preschool children interviewed was counting. Anderson (1997) found that naming shapes and naming numbers followed closely in frequency of math activities at home. The least common activities were

subtracting, representing shapes and numbers, and using fractions. Nonetheless, parents failed to make links between daily lives and these sessions, or even between previous sessions and the current session. Anderson (1997) conceded that more research is necessary to identify ways the math activities can be implemented in the home. She called for a greater variety of activities that pull in more than one type of mathematical category in parent-child interactions.

Starkey and Klein (2000) answered that call. Two samples of Head Start parent/child dyads, one African American ( $N = 28$ ) and one Mexican American ( $N = 31$ ), participated in a 4-month study, from January to May, of children's math development. The ages for the child participants ranged from 4 years, 2 months to 5 years, 3 months. Parent/child dyads were randomly assigned to an intervention group or to a comparison group who received no intervention or resource materials of any kind. The intervention parent/child dyads met biweekly for classes for a total of eight classes (Starkey & Klein).

During each class, a team of teachers would demonstrate a math activity (Starkey & Klein, 2000). Then, materials for the activity were distributed to each parent/child dyad. Teachers showed parents how to teach to their child's level as they moved around the class and monitored the activity sessions. Classes were held every other Saturday in the morning at the Head Start center. Lunch was served afterwards for all participants. The African American sample missed an average of 1.3 classes. The Mexican American sample missed an average of 1.4 classes. A library of math kits was available for check-out at the end of each class period. All children were

pretested and posttested in the fall and in the spring by an informal math assessment designed specifically for this study (Starkey & Klein).

In both the African American sample and the Mexican American sample, there were no differences between the comparison and intervention groups at the pretest (Starkey & Klein, 2000). The intervention group children scored significantly higher on the posttest, but the comparison group did not change from the pretest to the posttest. In the Mexican American sample, the comparison group did improve in enumeration; this finding was attributed to numerical instruction the children received at the same time from classroom teachers (Starkey & Klein).

If parents depend on preschool teachers to teach their children mathematics, they may be making hasty assumptions. Graham et al. (1997) suggested preschools may not view mathematics education as one of their major roles. Though their sample of four teachers from two different preschools was small, Graham et al. raised a viable issue. The two preschools served children from an educated, middle-class background and were well known for their developmentally appropriate practices and quality curriculum. The main differences between these schools were the teacher ratios and program set-up— one was an all-day preschool with age segregation and the other was a part-time university-affiliated program with children ages 3 to 5 in the same room.

Through observations and teacher interviews, Graham et al. (1997) found only 12 instances of mathematical discussion at one preschool and six at the other during the 12-hour observation. Out of these 18 mathematical interactions, only 2 lasted more than 1 minute. Most of these interactions were brief discussions about age or

numbers less than 3 and had very little to do with the task at hand. Most of the teachers reported that math education was not part of their role and preferred informal experience to teaching math in a formal way.

As mentioned previously, Klein and Starkey (2000) attempted to address the role preschools can play in children's math development. Findings from their Berkeley Math Project suggested that preschool curriculum may make a difference in children's math development. When preschool teachers taught children in their classrooms from a math curriculum consisting of math activities with concrete materials, children improved and tested higher than a comparison group previous-year students from the same preschool classrooms (Klein & Starkey).

Findings with family day care providers support the assertion that parents cannot depend on someone else to expose their preschool children to formal mathematics. Blevins-Knabe et al. (2000) interviewed 18 parents of children 4 to 6 years old and 22 family day care providers. Participants were asked to report the frequency of math interactions with their children on a Likert scale ranging from 1 representing never to 7 representing more than once a day. Surprisingly, no difference was discovered between the overall mean frequencies of math activities at home and in family day care. "Counting objects to find how many" and "talking to children about the order of events in the day" were the most frequent activities reported by both parents and family day care providers. Least frequent were the more formal activities of "measuring with a ruler" and "addition problems with numbers greater than two" (Blevins-Knabe et al.). Significant differences were found in three areas in which

providers reported a higher frequency of participation than parents. These were (1) "counting objects to find how many," (2) "using ordinal numbers," and (3) "asking which of two numbers is bigger" (Blevins-Knabe et al.).

### Math Attitudes

One reason that parents may not be drawing attention to math activities in real life is that they may not feel that math development is important or they may have negative feelings about math. Blevins-Knabe et al. (2000) found a relationship between parent math affect and the frequency of math activities. In their interviews with 18 parents of 4- to 6-year-old children, Blevins-Knabe et al. noted that parents who enjoyed math and reading and participated in the highest number of literacy activities also had the highest frequencies of math activities with their children. If parents reported enjoying math more than their own parents, then they also reported a higher frequency of math activities. Therefore, it may be important to help parents feel positive about math as one way to increase the frequency of math activities that they participate in with their children.

In a study designed to explore the relationship between preschool children's understanding of number concepts on entry into school and their home experiences, Young-Loveridge (1989) made an interesting discovery about the role of parental attitudes. Six subjects participated in this case study: two high-math-achieving children (found from the Number Tasks Interview) from high-SES homes; two high-math-achieving children from low SES homes; and two low-math-achieving children from high-SES homes. Mothers were interviewed to find out about the children's

home experiences and about the attitudes of both mother and father about mathematics (Young-Loveridge).

The results of this study suggested the important role of parents' attitudes (Young-Loveridge, 1989). Parents who had a strong numeracy orientation had children who were high math achieving. Mothers' expectations for their children in math were related to their own attitudes about math and perceptions about their own mathematical ability in the Number Tasks Interview. Young-Loveridge also found that, although none of the mothers reported enjoying math in school, mothers of high-math-achieving children were more supportive of fostering math activities in the home.

These findings support those found by Leder (1992). In an observational study of two 4-year-olds in the same preschool class—one bright child and one average child as identified by the Peabody Picture Vocabulary Test, the Franston Hospital Concept Test, and the Keymath Test—Leder found these children came from different home environments as measured by questionnaires, interviews with a parent, and a detailed diary of the children's activities as recorded by a parent. The high-math-achiever's mother encouraged independence while the low-math-achieving child's mother encouraged a more passive role. These roles parents developed for their children were reflective of their attitudes. Although these results were correlational and were a reflection of only two children's experiences, they show a relationship between children's math performance and parents' involvement and attitudes that needs to be more closely studied.



Linking Math Activities, Math Affect, and  
Math Achievement in Early Childhood

The relationship between math activities, math affect, and math achievement in early childhood was addressed in a study by Musun-Miller and Blevins-Knabe (1998). Using an interview questionnaire, 61 parents were asked about the importance of math. These responses were correlated with their kindergarten child's math achievement as tested by the TEMA-2 and no relationship was found. These results may mean that the attitude scale was too broad, that there may be an indirect relationship between the variables, or that parents' attitude about the importance of math and their kindergarten's math achievement are not related (Musun-Miller & Blevins-Knabe, 1998). Further, the relationship between parent's ratings of math importance and child's math performance may be mediated by parent's engaging in math activities with their child and, therefore, the number of math activities in which the child participates. Musun-Miller and Blevins-Knabe did not explore this assertion further other than stating this possible relationship.

Part of the relationship between affect and frequency of math activities has been shown in previous research. The number of math activities in which children participate with their parents and child achievement scores have been linked (Blevins-Knabe & Musun-Miller, 1996; Hasselbring & Moore, 1996). One such study was conducted by Blevins-Knabe and Musun-Miller and has been reviewed earlier in this narrative. Forty-nine kindergartners were tested on the TEMA-2 and 61 parents were interviewed from a questionnaire on math affect. Results indicated that there was a positive correlation between the number of activities in which a child participated and

parents' engagement in math activities with their child (this supports the "mediating" hypothesis). They also found a positive correlation between the number of activities the child participated in at home and the child's performance on the TEMA-2.

Blevins-Knabe et al. (2000) suggested that "it may be important to assist parents to feel more positive about mathematics" (p. 5). As discussed earlier in this paper, how parents felt about math was positively correlated with the number of math activities in which the child participated (Blevins-Knabe et al.). Unlike Blevins-Knabe and Musun-Miller (1996), Blevins-Knabe et al. found no relationship between frequencies of math activities and children's performance on the TEMA-2. The authors suggested this finding may be because a floor effect was noted with both measures.

### Assessment Techniques

#### Assessing Mathematics Abilities

There are five established tests that attempt to assess 4- and 5-year-old children's math ability. These tests are (1) Number Tasks Interview (Young-Loveridge, 1989), (2) TEMA-2 (Ginsburg & Baroody, 1990), (3) EMDK (Enger, 1992), (4) TABS-M (Braswell, 1978), and (5) EMC (Ashby, 1997). The Number Tasks Interview and the TEMA-2 limit their testing categories to number and number operations. These assessments confine the definition of mathematics in early childhood to numbers instead of encompassing a broader definition of mathematics that includes measurement, shape and space, and pattern. The EMDK and TABS-M

have no norms or reliability, which makes using these assessments for a pre- and posttest very difficult (Braswell, 1978; Enger, 1992). The best option for assessment available is the EMC. It tests the following categories: number (including number terms, counting and comparisons), pattern, measurement, space, and shape. The EMC also meets other standards of assessment. For example, the EMC is consistent with the "assessment principle" as described by the NCTM (Carpenter & Gorg, 2000).

The assessment principle is "assessment should support the learning of important mathematics and furnish useful information to both teachers and students" (Carpenter & Gorg, 2000, p. 371). The best mathematical assessments are not developed alone (Powell & Steele, 1995). They are the products of multiple people working together to help children meet curricular goals (Carpenter & Gorg). Assessments focus on thinking and on using multiple sources like questioning, observing, and documenting rather than paper-pencil standard answers given to groups (Powell & Steele).

Young students frequently possess greater knowledge than they are able to express in writing. Teachers need to determine what students already know and what they still have to learn. Information from a wide variety of classroom assessments—classroom routines, conversations, written work (including pictures), and observations—helps teachers plan meaningful tasks that offer support for students whose understandings are not yet complete and helps teachers challenge students who are ready to grapple with new problems and ideas. (Carpenter & Gorg, p. 76)

The EMC provides opportunities for assessors to use many of these qualifications. Assessors are asked to record misunderstandings for a better comprehension of the child's thinking. The child is also asked to write or dictate to the examiner two answers recorded in the pupil booklet and use a variety of

manipulatives (i.e. paper, cubes, coins) to answer questions. Assessors complete the assessment process through recording their observations in an accompanying workbook. In this way, the assessment looks for individual understanding as recommended by the NCTM (Carpenter & Gorg, 2000).

### Math Attitude Assessment

There are no specific recommendations by the NCTM (Carpenter & Gorg, 2000; Powell & Steele, 1995) regarding math affect assessments. A number of studies have developed their own parent questionnaires (Huntsinger et al., 1997; Musun-Miller & Blevins-Knabe, 1998) or interviews (Blevins-Knabe & Musun-Miller, 1996; Leder, 1992; Young-Loveridge, 1989) to test parents' math affect.

### Conclusion

This literature review has addressed mathematical reasoning, early childhood preparation in mathematics, strategies to promote mathematics proficiency during the early childhood years, and assessment techniques. The importance of fostering math concepts during early childhood has been emphasized. According to the present survey of literature, very little has been done with math interventions in the home before formal schooling. A quality intervention must be accompanied by quality assessment procedures. Proper assessment techniques have also been emphasized.

The present study addressed the gaps in current literature discussed in the literature review by conducting an early childhood, preschool, math intervention study with a comparison group that received psychosocial training. We proposed that

through a math-training intervention, parents could learn to use real-life problems to teach problem-solving like Thompson and Hixson (1984), and link informal and formal learning. The present study attempted to address the connection between the frequency of math activities as measured by math activity logs, mathematics attitudes scales as measured by adaptations of the short form of the FSMAS (Fennema & Sherman, 1976; Mulhern & Rae, 1998) entitled MAS and MAAMCAS, and math achievement as measured by EMC (Ashby, 1997) and the BBCS-R (Bracken, 1998) to better understand their relationship.

## CHAPTER III

## METHOD

## Sample

Thirty-five children and their mothers were included in the convenience sample for this study. Seventeen children comprised the comparison group and 18 children the intervention group. One of the major problems that must be noted about convenience samples is that they are nonprobability samples, which means that an inference cannot be made about the total population based on the sample (Dooley, 1995). To be eligible for this study, children could not be attending kindergarten and needed to have been born on or between September 1995 and September 1996 to be in the intervention group and born on or between January 1996 and January 1997 to be in the comparison group. These dates were chosen based on kindergarten entrance date and age-range acceptable for the EMC. (The EMC lists standardized scores for children up to 4 years, 3 months). Originally, the present author's intent was to start both the intervention and the comparison groups at the same time. Due to difficulties in locating a comparison group, this group started later than the intervention group, and, thus, the eligibility dates were pushed forward for the comparison group. One population from the Hyrum, Utah, area was recruited for participation in the intervention group. The comparison group was recruited from the Weston, Idaho, area. This assignment of geographic area to the comparison and intervention groups was done by coin-tossing. Minimal interaction, if any, between participants in the two

groups is assumed because of the distance between intervention and comparison group areas and of the location of both groups in different states and ecclesiastical boundaries.

Participants in this study were recruited from Church of Jesus Christ of Latter-day Saints (LDS) bishops and Relief Society (LDS women's organization) presidents in both the intervention and comparison locations. The bishops and Relief Society presidents were chosen because there is a concentration of children from both communities in the LDS church that makes the sample more easily attainable. The study was explained to Church leaders. They chose to either give names and phone numbers of potential study participants or to distribute sign-up sheets in their respective organizations (see Appendix A).

The present researcher or a trained volunteer then telephoned all prospective parent participants to determine that both parent and child participants were healthy and functioning within a normal range, and that child participants were within the designated age range (see Appendix B for the complete dialogue outline). All participants who volunteered were mothers. The study was explained to them and their questions were addressed. Parents completed the informed consent (see Appendix C) at the scheduled, child-participant assessments. If parents chose not to be present at the assessments, informed consent forms were mailed to them. All parent participants were asked if they had access to a tape recorder. If they did not, a tape recorder was provided. Next, all participants were asked to refer friends that might be interested in participating. These referrals were contacted by phone and

invited to participate in the study. Callers followed a similar dialogue to the telephone dialogue for interested participants who volunteered through a sign-up sheet (see Appendix D).

There were 20 mother-child dyads invited to participate from each community. Two child-mother dyads dropped out of the intervention group, and three child-mother dyads dropped out of the comparison group. Both of the mothers who dropped out of the intervention group attended the first meeting, but did not return phone calls or letters made by the researchers for the remainder of the study. Therefore, the children of both these participants were not posttested, and posttest data were not collected from the mothers. One of the mothers from the comparison (Weston) group dropped out 2 days before the first class because she decided that she was too busy to participate; therefore, no data were collected for this mother or her child. Another mother in the comparison group dropped out after the pretest assessments were complete because she also was too busy. The final comparison group mother dropped out during the second month because she was too busy.

For the comparison group, 17 prekindergarten children participated, eight males and nine females; all children were White. Sixteen of the mothers were married; one was remarried. Six of the mothers had some college. Six more mothers had 4-year college degrees or graduate degrees. Eleven of the mothers were full-time homemakers. Of those mothers who worked, only one worked full-time (40 hours per week or more). An income of \$30,000 to \$44,999 was the mode ( $n = 8$ ) of the comparison group. Based on the average family size and family income, the families



in the comparison group were above the national poverty threshold (U.S. Census Bureau, 2001).

The intervention group included 18 prekindergarten children, eight boys and 10 girls. Seventeen of the mothers were married; one was separated. Ten of the mothers had some college education. Additionally, three mothers had 4-year college degrees or graduate degrees. Fifteen of the mothers were full-time homemakers. Of the mothers who worked, none of them worked full-time (40 hours per week or more). The mode ( $n = 9$ ) for family income was \$30,000 to \$44,999 for the intervention group. Based on the average family size and family income, the families in the intervention group were also above the national poverty threshold (U.S. Census Bureau, 2001). See Table 1 for more characteristics of the sample.

Table 1

Means (Standard Deviations) and Ranges for Number of Children in Family, Child Participant Age, and Parent Participant Age

Variables	Comparison group	Intervention group
Number of children in family	4 (.87) 2-5	4 (1.29) 1-6
Child participant age	4 years 7 months (.28) 4y 2m-5y 2m	4 years 7 months (.30) 4y 0m-5y 0m
Parent participant age	30.82 years (6.04) 22-44	32.67 years (4.51) 28-42

## Instruments

### Assessors

In this study the assessments were given individually by one of six trained assessors. Each assessor was female, had a B. S. in child development or was currently enrolled in child development studies, and was unaware of the hypotheses of the study. To avoid bias and contamination of the sample, posttest and pretest assessors were not the same people. Training sessions were held for the assessors before the pretest and before the posttest.

The EMC assessment trainer was the author. EMC training lasted 45 minutes and consisted of background about the assessment, keys to giving the assessment, and scoring guidelines (see Appendix E). A standardized dialogue (see Appendix F) was developed by the author to assure similarity in assessment presentation. Assessors were asked to practice with two to three children on their own time before the testing began. The trainer observed each of the trainees at the beginning, middle, and end of all the pretesting and of all the posttesting to assure similarity in assessment protocol.

The BBCS-R trainer was Dr. Ann M. B. Austin, who is a child developmental psychologist and professor in family and human development at Utah State University. BBCS-R training lasted 45 minutes and consisted of background about the assessment, keys to giving the assessment, and scoring guidelines. Assessors were asked to practice with two to three children on their own time before the testing began. An experienced BBCS-R assessor observed each of the trainees at the beginning, middle,

and end of all the pretesting and of all the posttesting to assure similarity in assessment protocol.

#### Early Mathematics Concepts Scale

The math assessment selected for this research study was the EMC (Ashby, 1997). The EMC was specifically developed in England as a standardized assessment of 4- and 5-year-old children before entering school. The assessment can be given in groups or individually (individually is preferred) with the help of a pupil booklet and cubes. Children are asked assessment questions and asked to respond with either a written or oral response.

The four subtests covered in the EMC are number, pattern, measurement, and space and shape with 55 total items. Ashby (1997) calls each subtest a "focus." The focus with the most items is number, which has 28. The focus with the least items is measurement, which has two items. The test can be given in one administration or over a period of time, giving one focus assessment at a time. In this study the entire test was administered in a single visit. Approximate test time for the complete test, when given individually, is 30 minutes. The EMC yields a standardized score along with a score for each of the four foci (Ashby, 1997).

In 1994, EMC was standardized using a stratified sample from 279 schools in England and Wales. The sample included 1,749 students, 897 boys and 848 girls, who ranged in age from 3 years 10 months to 5 years 8 months (Ashby, 1997). Overall Cronbach's alpha was .91.

Ashby (1997) identified three sources of possible validity issues related to the

EMC. Although there were plans made by the test designers to test this original group again in 1997 to establish predictive validity, these results have not yet been published to our knowledge. Since the EMC scores have not been correlated with any other early math test, concurrent validity is not known. Content validity appears to be the strongest source of validity for this test because the items on this assessment are based on the national curricula for Scotland, Northern Ireland, England, and Wales (Ashby).

#### Bracken Basic Concept Scale-Revised

The BBCS-R (Bracken, 1998) is composed of two separate instruments. The first instrument is the screening test which comes in two alternate forms and is used to test children ages 5 years, 0 months to 7 years, 0 months. The second instrument is the Diagnostic Scale which tests children ages 2 years, 6 months to 7 years, 11 months on 308 concepts.

Eleven subscales constitute the BBCS-R with the first six scales making up the school readiness composite (SRC), which was used in this study. Identification of color, letters, numbers/counting, sizes, comparisons, and shapes are included in the SRC. From four possible choices, children are asked to point to or vocalize a correct response shown on a stimulation card (Bracken, 1998). The reliability coefficients for the SRC in the BBCS-R are as follows: .96 for 4-year-olds; .97 for 5-year-olds; .91 average across age levels. The test-retest reliability was .88 (Bracken).

The BBCS-R (Bracken, 1998) has established criterion and content validity. For criterion validity, the BBCS-R reports "strong" correlations with other measures of basic concepts. For example, the BBCS-R SRC and the Wechsler Preschool and

Primary Scale of Intelligence-Revised (WPPSI-R) correlate at  $r = .88$ . The correlations between the Differential Ability Scales (DAS) composite standard scores and the BBCS-R SRC were .69 for the DAS verbal cluster, .72 for the DAS nonverbal cluster, and .79 for the general conceptual ability. As evidence of content validity, the BBCS-R scales were based on high correlations between the BBCS-R and other tests used to measure the same construct, on internal validity, and on discriminant analysis (Bracken).

My Attitudes Scale and My Attitudes  
About My Child's Abilities Scale

No study, to our knowledge, addresses parents' attitudes about their prekindergarten child's math abilities or parents' attitudes about their own abilities in math. The most extensively used math attitudes scales, the FSMAS (Fennema & Sherman, 1976), were written for high school students. Therefore, current attitudes measures had to be adjusted to fit the purposes of this study.

This research study used two attitudes scales, MAS and MAAMCAS. Both attitudes scales are adapted from the shortened form of the FSMAS (Mulhern & Rae, 1998). The original FSMAS (Fennema & Sherman, 1976) have been adapted and used for over 20 years for various age groups (Mulhern & Rae). These scales were originally used with high school students to identify their affect for math. This scale is composed of nine subscales including the attitude toward success in mathematics scale; the mathematics as a male domain scale; the mother, father, and teacher scales; the confidence in learning mathematics scale; the mathematics anxiety scale; the

effectance motivation in mathematics scale; and the usefulness of mathematics scale (Fennema & Sherman). In all the adaptations since then, the scales have shown alpha reliabilities ranging from .79 to .96 (Mulhern & Rae). In this study, parents, or more specifically mothers, used an adaptation of the shortened form of the FSMAS developed by the present author to test for parental math anxiety and parental expectations for children's math ability. Using a 5-point Likert scale, parents can strongly agree or strongly disagree with statements reflecting their attitudes about mathematics. In a pilot study conducted by the present author, the MAS reliability was .88 and the MAAMCAS reliability was .89. In the current study, the MAS reliability was .92 at the pretest and .92 at the posttest, and the MAAMCAS reliability was .85 at the pretest and .70 at the posttest.

This study used adaptations of three of the nine original mathematics attitudes scales for a total of 12 items. The math anxiety subscale composed of five items was adapted from Mulhern and Rea's (1998) condensed version of Fennema and Sherman's (1976) Mathematics Attitudes Scales. The math anxiety scale tests the parents' attitudes about their own math abilities. Hence, the new adapted measure was called MAS.

The parent's attitudes scale (Mulhern & Rea, 1998), a modified form of father and mother scales (Fennema & Sherman, 1976), was also adapted into a new scale called MAAMCAS, to test how parents feel about their child's math abilities. This new scale, composed of seven items, was adapted by transforming statements intended for children to answer about their parents to statements parents answered about their

child (e.g., "My father thinks that mathematics is one of the most important subjects I have studied" became "I think that mathematics is one of the most important subjects for my child to study"). In order to disguise the mathematical focus of this test, each item was also reworded so the "mathematical" term was replaced with a "reading" term; for example "I think that mathematics is one of the most important subjects for my child to study" became "I think that reading is one of the most important subjects for my child to study." Thus, seven questions addressed math directly and seven addressed reading.

Mulhern and Rae (1998) found an overall alpha of .90 in the FSMAS and an alpha of .93 for the short form FSMAS of the math anxiety scale. An alpha of .91 for the father's attitudes and an alpha of .84 for the mother's attitudes were identified in the FSMAS. An alpha of .90 was reported for Mulhern and Rae's condensed category labeled parent's attitudes in the short form FSMAS.

Mothers completed the parent questionnaire, containing the two attitudes scales, during the child's pretest and posttest assessments. If parents chose not to be present during the assessments, the parent questionnaire was mailed to them to complete and return.

#### Procedures

In order to test the hypotheses, a simple pretest-posttest comparison group design was used over 3 months. In order to avoid contamination of the sample, participants were not randomly assigned to a group. Rather, one geographical area

was the comparison group and the other area was the intervention group. This nonrandom assignment allowed the researcher to minimize the contact between the intervention and comparison groups. There were also possible threats to internal validity in this study because the groups did not begin the study at the same time, therefore there could be history threats. Events outside the study, like the season, may have affected the results of the study. (Most of the study in Hyrum took place before the summer while most of the study in Weston took place during the summer.) These threats are believed to be minimal. There may have been a problem with pretest sensitization because both of the groups were receiving a pretest. To decrease the chances of this sensitization, the pretest had been disguised as a developmental test. Parents did not know that the focus of the study was on mathematics. Children were also tested using the BBCS-R to disguise the purposes of the study (Bracken, 1998). Additionally, the pretests and posttests were the same tests, so there also may be some test reactivity if the child participants remembered prior questions (Dooley, 1995).

During the initial telephone contact, parents received a brief explanation of the study and were invited to participate (see Appendix B and Appendix D). All parent participants were mothers. Then, through a list of questions, researchers determined the optimal meeting times and days and whether child care would be required. Parents were recontacted once all potential participants had suggested meeting times. Reminders for the meetings were sent to each parent 1 week prior to the monthly meetings (see Appendix G). If parents did not attend meetings, they were contacted and asked to make an appointment for a make-up meeting, which was held within the



same month at the parent's home or a neighbor's home who had also missed the meeting. Although parents could choose any time, any day, and any place for their make-up meeting, some parents were still unable to make an appointment for the meeting because they were too busy. Child care providers were given specific instruction to avoid mathematical discussions. Child care was provided for each meeting and providers played a Disney movie for the children, gave the children crayons and paper to color with, or shared puppets and puzzles with the children. Both groups received the same child care activities.

All child assessments were completed by appointment at the child's home or a centralized location such as a preschool or public building. Children were assessed using the EMC (Ashby, 1997) and BBCS-R (Bracken, 1998). To avoid contaminating the mean of one assessment with the other by have one assessment consistently first, half of the children were assessed using the EMC first. The other half of the child participants were assessed using the BBCS-R first (see Appendix H). Parents unknowingly assigned themselves to one of these groups by choosing the assessment time.

While the child was assessed, parents filled out the Parent Questionnaire (Appendix I), which included the math attitudes assessments mathematics attitudes scales as measured by MAS and MAAMCAS. Informed consent was also collected at this time (see Appendix C). If parents were unable to be present during the testing (some of these children were tested at their preschool and some parents chose not to come to the preschool to watch the testing), the informed consent and the parent

questionnaire were mailed, along with an instructional memo (see Appendix J), prior to the child's scheduled assessment. At the last parent meeting, parents were asked, once again, to complete the MAS and MAAMCAS. Parents who did not attend the last meeting ( $N = 14$  for intervention group,  $N = 15$  for the comparison group) were mailed the attitudes measure and a memo with brief instructions (see Appendix K). Parents who missed the last meeting forgot to come or were too busy to come.

#### Pilot Study

Three middle-class, White mothers of prekindergarten children were interviewed by the researcher. All mothers were referred by an undergraduate student studying early childhood development. The requirements for parents to participate in the study were described. They reviewed the journal pages (see Appendix L and Appendix M) that parents would be asked to complete. All mothers agreed that the requirements sounded reasonable. The mothers also described the journal pages as clear and easy to understand. A sample newsletter (see Appendix N) was then shown to the mothers. They commented that the conciseness and clarity of the newsletter made the newsletter "parent friendly."

Finally, pilot study mothers were asked to complete the mathematics attitudes scales as measured by MAS and MAAMCAS. The mothers gave mostly positive feedback about the MAS. They were initially confused about the statement "I usually have been at ease in math classes" because the mothers wanted to know which math classes this question referred to. In order to clarify this question, the statement was

changed to, "When I was in school, I was at ease in math classes."

The mothers in the pilot study had more concerns about the second measure, MAAMCAS. First, the mothers were unsure what "math" and "reading" meant for prekindergarten children. Therefore, the term "math" was replaced by "mathematics tasks (e.g., counting, recognizing number and shapes, measuring)." The term "reading" was replaced by "pre-reading tasks (e.g., knowing the names and sounds of letters)." Mothers also had concerns that the questions seemed very repetitive. No changes were made in connection with this feedback because the integrity of the instrument would be overly compromised by drifting too far from Mulhern and Rae's (1998) parent scale.

A second pilot study was conducted with five volunteer mothers from Hyde Park, Utah. These five mothers of prekindergarten children completed the revised MAS and MAAMCAS. Mothers once again commented on the repetitiveness of the scales but noted no further adjustments to be made. The means of the mothers' attitudes scales were MAS,  $M = 20.00$  ( $SD = 4.64$ ), and MAAMCAS,  $M = 28.80$  ( $SD = 5.54$ ). The alpha coefficients were .88 for the MAS and .89 for the MAAMCAS. These data were comparable to those later gathered in the study.

### Curricula

The present study focused primarily on formal math instruction. Formal math instruction emphasizes mathematical language and symbols (English, 1998). This type of instruction is most closely associated with formal school situations. For

purposes of this study, parents were taught to be formal math instructors for their child. They were asked to set aside time with their child three times a week specifically for math interaction. At the same time, parents in the comparison group were trained to be formal psychosocial instructors for their children. These parents were taught from a psychosocial curriculum that avoided representing any of the mathematical concepts, which are often found in social, cognitive, and problem-solving domains, such as ratios and one-to-one correspondence (U.S. Department of Education, 1993). Since Case et al. (1999) have suggested that perhaps there are components of mathematics in most other domains, care was taken in the comparison group curriculum not to discuss mathematics components in a psychosocial example.

Parents in both groups were asked to interact one-on-one with their child for a minimum of 10 minutes three times a week. Parents were encouraged to use activities presented at monthly group meetings. During the group meetings, parents learned about being teachers for their children and about specific areas of child development with a psychosocial domain or a mathematical domain. Special care was taken in conducting the present study to avoid "teaching to the test." Hopefully, by focusing on the categories within the mathematics domain in the intervention group instead of specific skills this was avoided. NCTM (Carpenter & Gorg, 2000) has suggested that "teaching to the test" undermines the integrity of the instruction. These activity sessions were tape recorded to ensure that the tri-weekly interactions were taking place.

After the sessions, parents were asked to fill out a journal of math or

psychosocial activities for each parent-child session (see Appendix L for math log and Appendix M for psychosocial log). The journals were sent to the researcher when completed. A raffle was held at the second, third, and final meetings for parent participants who completed activity logs. Tapes were returned to the researcher at the monthly meetings. All tapes and assessment scores were kept confidential in a locked room in a locked file cabinet. Parents were invited to request the return of activity session tapes 1 month after the completion of the posttests. One month after the completion of the study, parents received a letter containing the child's pre- and post-test scores as well as suggestions for strengthening their child's weaker skill areas (see Appendix O).

#### Intervention Group

The mathematics curriculum was developed by the present author using Charlesworth and Lind (1999), Fabricant (1985), Greenberg (1993), and Marshall (1992) as a foundation. The specific concepts included in the curriculum were those of Ashby (1997), namely: pattern, shape and space, number, and measurement. Parents met monthly for a lesson and activity over a period of 3 months; therefore, there were a total of four lessons (beginning lesson and three monthly lessons). At the first meeting, parents received a packet including a list of math terms (see Appendix P), math logs (see Appendix L), guidelines for the parent/child interaction activity sessions (see Appendix Q), and blank tapes. One week after each meeting, parents received a newsletter (see Appendix R) with summaries of these meetings, activity suggestions, answers to parents' questions, a list of children's math books, and parent

feedback. A raffle was held at the second, third, and final meetings for parent participants who completed math logs. The last meeting encouraged parents to continue working with their child on mathematics.

The structure of the class was consistent across the 3 months (see Appendix S for lesson plans). Each class began with a 5-minute question/answer/share session followed by a 30-minute lesson. Fifteen minutes of the lesson time was on a specific math topic that trained parents in their role as math teachers (i.e., math anxiety, the role of parents as formal math instructors, thinking math versus content math, math in everyday life). The remainder of the lesson time, 15 minutes, was used to discuss a specific domain of math based on Ashby's work (1997; e.g., number sense, patterns and relationship, measurement). This second part of the lesson related specifically to the concepts parents teach to children. The specific math topic lessons and math domain lessons were based on readings from Charlesworth and Lind (1999), Fabricant (1985), Greenberg (1993), and Marshall (1992). The last portion of the class (25 minutes) was used to discuss possible ideas for the required math activities for the parent/child tri-weekly sessions and to create a math manipulative from everyday items (e.g., math symbols made from sponges).

#### Comparison Group

The psychosocial curriculum was taken from the U.S. Department of Education's (1993) program "Drug Prevention for Early Childhood." The program was originally designed to be used with home visitors, but it was adapted for the parent-meeting setting. This program recognizes that preschool children do not use

drugs or understand what drugs are or why they are dangerous. Therefore, this program emphasized children's healthy psychosocial development. Case (1998) suggested that psychosocial development and mathematical thinking are independent domains; therefore, a psychosocial intervention should not affect scores on mathematical assessment. On the other hand, Piaget (1983) suggested that mathematical ("logicomathematical") thought was the core of all intelligence development. However, current thought follows independent domains (Case), so, for purposes of this study, independent domains of mathematical and psychosocial development are assumed.

Similar to the math group, parents met monthly for a lesson and activity over a period of 3 months. There were four lessons (beginning lesson and three monthly lessons). At the first meeting, parents received a packet including a list of psychosocial terms (see Appendix T), psychosocial development logs (see Appendix M), instructions for tape recording the parent/child interaction sessions (see Appendix P), and blank tapes. Parents received a newsletter (see Appendix U) one week after the meeting that included summaries of these meetings, activity suggestions, answers to parents' questions, a list of relevant children's books, and parent feedback. At the second, third, and final meetings a raffle was held for parent-participants who completed psychosocial development logs. The final meeting encouraged parents to continue working with their child as a teacher.

The structure of the class was consistent across the 3 months and consistent with the math class structure (see Appendix V for lesson plans). A 5-minute

question/answer/share opened the class which was followed by a 30-minute lesson. A specific psychosocial development topic that trained parents in their role as teachers (i.e., self-esteem, the role of parents as formal instructors, the role of parents as mediators, learning in everyday life) was addressed for 15 minutes of the lesson time. The remaining 15 minutes of the lesson time was used to discuss psychosocial concepts parents can teach like setting limits and building children's confidence. The final 25 minutes of the class was used to discuss possible ideas for the required psychosocial development activities for the parent/child tri-weekly sessions and to create a manipulative from everyday items (e.g., people made from sponges).



## CHAPTER IV

## RESULTS

## Data Analyses

This section will start by giving descriptive statistics for all dependent measures within the intervention and comparison groups. Next, correlations between independent and dependent variables using combined intervention and comparison groups are given. Implementation outcomes will be addressed. Finally, the eight hypotheses will be restated and the results summarized.

Early Mathematics Concepts

Cronbach alpha coefficients were calculated to ensure that internal consistency estimates for the EMC were similar to those of past research (e.g., Ashby, 1997). The internal consistency measurements for the total scale were  $\alpha = .91$  at the pretest and  $\alpha = .90$  at the posttest. These estimates were identical to those reported by Ashby ( $\alpha = .91$ ).

The means (with standard deviations) and ranges for the EMC scores are found on Table 2. Because of difficulties in finding the participants for the study, problems with the assessments arriving in the mail later than expected, and assessment scheduling problems, three of the children in the intervention group and five of the children in the comparison group could not receive standardized scores because their age was beyond those ages for which standardized scores were provided by Ashby (1997). Therefore, the present author substituted a standardized score based on the

Table 2

Means (Standard Deviations) and Ranges for the EMC Pretest and Posttest byComparison/Intervention Group Association

Group	EMC pretest	EMC posttest
Intervention	96.00 (11.36) 78-118	95.11 (9.93) 77-108
Comparison	95.35 (14.98) 75-119	95.12 (12.99) 70-108
Total sample	95.68 (13.05) 75-119	95.11 (11.34) 70-108

largest age bracket available, 5 years 3 months. Table 3 gives pretest and posttest means, standard deviations, and range for the foci by group (intervention or comparison).

Bracken Basic Concept Scale-Revised

Cronbach alpha coefficients were also calculated to ensure that internal consistency estimates for the BBCS-R were similar to those of past research (e.g., Bracken, 1998). The internal consistency for the school readiness composite (SRC; pretest alpha = .96, posttest alpha = .94) was similar to that reported by Bracken (1984; alpha = .95 for 4-year olds and .90 for 5-year olds). The means (with standard deviations) and ranges for the SRC at the pretest were  $\bar{M} = 100.37$  ( $SD = 14.90$ ), 73 - 122; at the posttest,  $\bar{M} = 100.54$  ( $SD = 12.46$ ), 79 - 123. See Table 4 for the means and ranges of the SRC subscales.

Table 3

Means (Standard Deviations) and Ranges for Each Focus of the EMC Pretest and Posttest by Comparison/Intervention Group Association

Group	Number		Measurement		Shape & space		Pattern	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Combined	22.49	27.77	1.60	1.57	5.03	4.89	7.83	8.97
	(9.58)	(7.66)	(.55)	(.56)	(1.25)	(1.39)	(4.51)	(4.31)
	9-41	13-41	0-2	0-2	2-6	1-6	0-12	0-12
Intervention	23.00	28.28	1.67	1.39	5.11	5.00	8.00	8.78
	(7.57)	(7.09)	(.49)	(.61)	(1.18)	(1.19)	(4.50)	(4.14)
	12-37	14-38	1-2	0-2	3-6	2-6	0-12	0-12
Comparison	21.94	27.24	1.53	1.76	4.94	4.76	7.64	9.18
	(11.55)	(8.40)	(.62)	(.44)	(1.34)	(1.60)	(4.65)	(4.61)
	9-41	13-41	0-2	1-2	2-6	1-6	0-12	0-12

Table 4

Means (Standard Deviations) and Ranges for the Subscales of the SRC Pretest and Posttest

Subscale	Pretest	Posttest
Colors	9.43 (2.37) 2-11	10.46 (1.31) 4-11
Letters	6.23 (5.95) 0-16	7.11 (6.05) 0-16
Numbers/counting	8.89 (6.70) 1-19	11.60 (5.56) 0-18
Sizes	8.14 (2.12) 4-12	9.31 (1.79) 4-12
Comparisons	3.89 (2.54) 0-9	4.91 (2.42) 1-10
Shapes	10.31 (3.57) 1-18	13.00 (3.38) 6-19

### Math Attitudes Assessments

To ensure that internal consistency estimates for MAS and MAAMCAS were similar to the pilot study referred to earlier in this paper, Cronbach alpha coefficients were calculated (see Table 5).

The means (with standard deviations) and ranges for the MAS and the MAAMCAS for the pretests and posttests are found on Table 6. Neither a Pearson correlation coefficient between the MAS and the MAAMCAS at the pretest ( $r = .15$ ) nor at the posttest ( $r = .30$ ) was statistically significant.

Table 5

#### Cronbach Alpha Coefficients for the MAS and the MAAMCAS

	Pilot Study	Pretest	Posttest
MAS	.88	.92	.92
MAAMCAS	.89	.85	.70

Table 6

#### Means (Standard Deviations) and Ranges for the MAS and MAAMCAS Pretest and Posttest by Comparison/Intervention Group Association

Group	MAS		MAAMCAS	
	Pretest	Posttest	Pretest	Posttest
Intervention	16.33 (3.43) 10-22	17.44 (4.06) 11-25	29.33 (3.55) 24-35	30.00 (2.79) 25-34
Comparison	17.33 (5.22) 6-25	17.75 (5.56) 5-25	28.53 (5.95) 14-35	30.31 (3.09) 26-35
Total sample	16.79 (4.26) 6-25	17.59 (4.75) 5-25	28.97 (4.73) 14-35	30.15 (2.89) 25-35

Multicollinearity was ruled out because there was not a statistically significant correlation between the pretest MAS and the pretest MAAMCAS,  $r(33) = .17, p > .05$  and between the posttest MAS and the posttest MAAMCAS,  $r(34) = .31, p > .05$ .

#### Correlations of Independent and Dependent Measures

Correlations were obtained for independent and dependent measures using combined data from the intervention and comparison groups. Correlations between independent variables are shown in Table 7 and broken down by intervention and comparison group in Table 8 and Table 9, respectively. A total of four statistically significant correlations emerged among the independent variables. The correlations

Table 7

#### Correlations Between Independent Variables

	Group (Intervention/ Comparison)	MAS Pretest	MAS Posttest	MAAMCAS Pretest	MAAMCAS Posttest	Activity Level
Group (Intervention/ comparison)						
MAS pretest	-.12					
MAS posttest	-.03	.82**				
MAAMCAS pretest	.09	.17	.30			
MAAMCAS posttest	-.06	.37*	.31	.75**		
Activity level	.34*	-.14	-.03	-.09	-.19	

\*  $p < .05$

\*\*  $p < .01$

Table 8

Correlations Between Independent Variables for the Intervention Group

	MAS pretest	MAS posttest	MAAMCAS pretest	MAAMCAS posttest	Activity level
MAS pretest					
MAS posttest	.75**				
MAAMCAS pretest	.12	.17			
MAAMCAS posttest	.14	.19	.63**		
Activity level	-.05	-.19	-.21	-.24	

\*  $p < .05$ \*\*  $p < .01$ 

Table 9

Correlations Between Independent Variables for the Comparison Group

	MAS pretest	MAS posttest	MAAMCAS pretest	MAAMCAS posttest	Activity level
MAS pretest					
MAS posttest	.87**				
MAAMCAS pretest	.19	.42			
MAAMCAS posttest	.55*	.39	.88**		
Activity level	-.14	.17	-.05	-.10	

\*  $p < .05$ \*\*  $p < .01$

between the pre- and posttest scores on the MAS and MAAMCAS were,  $r(32) = .82$ ,  $p < .01$ , and  $r(32) = .75$ ,  $p < .01$ , respectively. There was also a statistically significant correlation between the pretest MAS score and the posttest MAAMCAS score,  $r(32) = .37$ ,  $p < .05$ . Finally, there was a statistically significant correlation between the parent-participant's activity level in home activities with the child (either high or low as defined earlier in this narrative) and the group (intervention or comparison) to which the parent participant belonged,  $r(35) = .34$ ,  $p < .05$ .

Correlations between the dependent variables are found in Table 10. Table 11 and Table 12 show the correlations between the dependent variables broken down by intervention group and comparison group, respectively. Five of the correlations are of theoretical interest. First, pretest and posttest EMC standardized scores were positively correlated,  $r(35) = .72$ ,  $p < .01$ . Next, pretest EMC standardized scores were negatively correlated with the change in the MA score,  $r(32) = -.36$ ,  $p < .05$ , indicating that children who scored lower at the pretest on the EMC had parents who showed the biggest change in attitudes regarding their own math abilities by the end of the study. Finally, number focus scores for the EMC were statistically significantly correlated at the pretest with pretest pattern focus and the pretest measurement focus and at the posttest with all of the other three foci pretest scores.

Correlations between independent and dependent variables are presented on Table 13. A number of theoretically interesting correlations were noted. There was a statistically significant correlation between activity level classification and posttest EMC standardized score,  $r(35) = .36$ ,  $p < .05$ . Children who participated in more

Table 10

Correlations Between Dependent Variables

		EMC- pretest					EMC- posttest					Change in attitudes	
		Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	MAS	MAAMCAS
EMC- pretest	Pattern focus												
	Measurement focus	.30											
	Shape & space focus	.17	-.07										
	Number focus	.64**	.55**	.32									
	Standardized score	.79**	.54**	.38*	.73**								
EMC- posttest	Pattern focus	.43**	.18	.38*	.31	.42*							
	Measurement focus	.01	-.10	.36*	.18	.13	.28						
	Shape & space focus	.36*	-.14	.58**	.37*	.43**	.25	.32					
	Number focus	.58**	.24	.40*	.75**	.73**	.54**	.41*	.58**				
	Standardized score	.59**	.19	.46**	.59**	.72**	.74**	.38*	.60**	.89**			
Change in attitudes	MAS	-.20	.17	.08	-.22	-.36*	.09	.16	-.19	-.15	-.19		
	MAAMCAS	.01	.05	.16	.11	.09	.00	.11	.19	.10	.05	-.15	

\*  $p < .05$ \*\*  $p < .01$



Table 11

## Correlations Between Dependent Variables for the Intervention Group

		EMC- pretest					EMC- posttest					Change in attitudes	
		Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	MAS	MAAMCAS
EMC- pretest	Pattern focus												
	Measurement focus	.24											
	Shape & space focus	-.04	.00										
	Number focus	.42	.27	.43									
	Standardized score	.72**	.49*	.33	.81**								
EMC- posttest	Pattern focus	.04	.17	.40	.21	.21							
	Measurement focus	-.02	-.13	.51*	.27	.09	.46						
	Shape & space focus	-.03	-.31	.46	.09	.03	-.04	.41					
	Number focus	.32	-.07	.48*	.64**	.51*	.47*	.63**	.59**				
	Standardized score	.32	.09	.46	.53*	.57*	.68**	.49*	.46	.89**			
Change in attitudes	MAS	-.49*	-.33	-.00	-.41	-.71*	-.01	.37	.06	-.16	-.36		
	MAAMCAS	-.13	.09	.14	-.18	-.14	.05	-.09	.18	.03	.03	-.02	

\*  $p < .05$ \*\*  $p < .01$

Table 12

## Correlations Between Dependent Variables for the Comparison Group

		EMC- pretest					EMC- posttest					Change in attitudes	
		Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	MAS	MAAMCAS
EMC- pretest	Pattern focus												
	Measurement focus	.12											
	Shape & space focus	.27	-.04										
	Number focus	.68**	.55*	.36									
	Standardized score	.82**	.41	.45	.94**								
EMC- posttest	Pattern focus	.80**	.20	.36	.38	.58*							
	Measurement focus	.08	.03	.29	.18	.22	.05						
	Shape & space focus	.67**	-.06	.66**	.51*	.67**	.46	.36					
	Number focus	.81**	.45	.33	.81**	.88**	.61**	.29	.58*				
	Standardized score	.81**	.25	.47	.63**	.81**	.79**	.35	.69**	.90**			
Change in attitudes	MAS	.20	-.05	.15	-.07	-.01	.21	-.13	.32	-.17	-.04		
	MAAMCAS	.10	.25	.39	.32	-.07	.19	.24	.23	.09	-.04	-.25	

\*  $p < .05$ \*\*  $p < .01$

activities with their parents scored higher on the EMC at the posttest. These children also scored higher on the posttest EMC shape and space focus,  $r(35) = .42, p < .05$ .

### Implementation Outcomes

Four meetings were held for both the intervention and comparison groups. The number of mothers who attended the meetings decreased with each meeting. The means for the number of meetings attended (with standard deviations) was  $M = 2.56$  ( $SD = 1.10$ ) for the intervention group,  $M = 2.24$  ( $SD = 1.20$ ) for the comparison group.

Mothers were asked to do three 10-minute activity sessions per week with their prekindergarten child. In the intervention group, two mothers completed all 39 activity logs, whereas none of the mothers in the comparison group completed 39 activity logs. Three intervention participants and seven comparison participants completed no activity logs. The means (with standard deviations) and ranges for the number of activity logs completed were intervention group,  $M = 17$  ( $SD = 13.79$ ), 0 - 39, and comparison group  $M = 8$  ( $SD = 12.99$ ), 0 - 37.

When the activities from the math activity sessions were categorized as formal or informal math activities, the means (with standard deviations) and ranges were for the number of formal math activities  $M = 17$  ( $SD = 13.94$ ), 0 - 39, and for the number of informal math activities  $M = 8$  ( $SD = 8.30$ ), 0 - 26. Out of the 18 intervention group mothers who completed this study, 9 applied at least one math activity session to everyday life. The mean (with standard deviation) for the number of activities that applied to everyday life was  $M = 1$  ( $SD = 1.94$ ) for these nine mothers.

Table 13

Correlations Between Independent and Dependent Variables

	EMC- posttest							Change in attitudes	
	EMC- pretest standardized score	Pattern focus	Measurement focus	Shape & space focus	Number focus	Standardized score	Standardized score (Intervention only)	MAS	MAAMCAS
Group (Intervention/ comparison)	.05	-.05	-.34*	.09	.07	0.00		.08	-.25
MAS pretest	.08	.24	-.18	.02	.07	.13	-.24	-.12	-.04
MAS posttest	-.22	.19	-.06	.02	-.16	-.08	-.43	.47**	-.12
MAAMCAS pretest	-.01	.27	.03	-.21	.04	.11	.16	.14	-.81**
MAAMCAS posttest	.23	.46**	.19	-.10	.22	.26	.23	.07	-.21
Activity level	.28	.18	.13	.42*	.32	.36*	.61**	.14	-.09

\*  $p < .05$ \*\*  $p < .01$

### Results of Hypotheses Testing

Hypotheses one through six were analyzed using  $t$ -test statistics. Hypotheses seven and eight were examined using Pearson's correlation coefficients. Statistical significance was set at  $p \leq .05$ .

H1: *Following intervention, posttest total scores on the EMC (Ashby, 1997) will be higher for the intervention group than for the comparison group.*

This hypothesis was not supported by the data. Using  $t$ -test statistics, posttest EMC standardized scores were no different between the comparison and intervention groups,  $t(35) = .002$ ,  $p > .05$ . However, differences were found within this group when the intervention group was split by activity level,  $t(18) = -3.08$ ,  $p < .01$ . Activity level clustered at two ends of the scale. High activity was defined as 20 or more math activity logs completed and returned ( $n = 9$ ). Low activity was defined as fewer than 20 activity logs completed and returned ( $n = 9$ ; all these low log participants returned 12 or fewer activity logs). The means (standard deviations) of the activity level subgroups were  $M = 89.22$  ( $SD = 4.09$ ) for the low-activity level subgroup and  $M = 101.00$  ( $SD = 6.18$ ) for the high-activity subgroup. Differences in the posttest means were statistically significant at the alpha level of .05,  $p < .01$ . These statistically significant differences in means by activity level for the intervention group were not present at the pretest,  $t(35) = -1.89$ ,  $p > .05$ , and no mean differences were found in the change in scores from pretest to posttest by activity level for the intervention group,  $t(18) = .205$ ,  $p > .05$ .

H2: *Following intervention, posttest results in the EMC measurement focus*

*will be higher for the intervention group than for the comparison group.*

This hypothesis was also unsupported by the data. Using  $t$ -test statistics, EMC measurement focus posttest scores were compared between the comparison and intervention groups. Statistically significant differences were not found,  $t(35) = -1.92$ ,  $p > .05$ . Although there were statistically significant differences at the posttest by activity level in the intervention group,  $t(18) = -2.13$ ,  $p < .05$ , no statistically significant mean differences were found in the change in scores from pretest to posttest by activity level for the intervention group,  $t(18) = 1.47$ ,  $p > .05$ .

*H3: Following intervention, posttest results in the EMC number focus will be higher for the intervention group than for the comparison group.*

Data, once again, did not support this hypothesis. A comparison between the comparison and intervention groups using  $t$ -test statistics was used to examine this hypothesis. Differences were not found statistically significant,  $t(35) = -.01$ ,  $p > .05$ . There were differences at the posttest by activity level in the intervention group,  $t(18) = -3.45$ ,  $p < .01$ , but no mean differences were found in the change in scores from pretest to posttest by activity level for the intervention group,  $t(18) = -1.45$ ,  $p > .05$ .

*H4: Following intervention, posttest results in the EMC pattern focus will be higher for the intervention group than for the comparison group.*

This hypothesis was unsupported by the data. EMC pattern focus posttest scores were compared between the comparison and intervention groups using  $t$ -test statistics. Statistically significant differences were not found,  $t(35) = -.47$ ,  $p < .65$ . Statistically significant mean differences were not found by activity level for the

intervention group,  $t(18) = .56, p > .05$ , nor were statistically significant mean differences found in the change in scores from pretest to posttest by activity level for the intervention group,  $t(18) = -1.37, p > .05$ .

*H5: Following intervention, posttest results in the EMC shape and space focus will be higher for the intervention group than for the comparison group.*

The data did not support this hypothesis. Using  $t$ -test statistics, differences between the comparison and intervention EMC shape and space focus posttest scores were not statistically significant,  $t(35) = .16, p < .88$ . Although there were differences at the posttest by activity level in the intervention group,  $t(18) = -2.83, p < .05$ , no statistically significant mean differences were found in the change in scores from pretest to posttest by activity level for the intervention group,  $t(18) = .76, p > .05$ .

*H6: Following intervention, parents in the intervention group will have a larger change in scores from the pretest and posttest on the mathematics attitudes scales as measured by MAS and MAAMCAS.*

This hypothesis was not supported by the data. Using the differences in scores between the pretest MAS score and the pretest MAAMCAS score, comparison and intervention groups were compared. Statistically significant differences were not evident,  $t(32) = -.42, p > .05$ .

*H7: Parent's mathematics attitudes scales as measured by MAS and MAAMCAS will predict children's scores on the EMC.*

This hypothesis was not supported by the data. Pearson correlation coefficients were used to determine the relationship between the score on MAS and

the MAAMCAS and the standardized score on the EMC. No statistically significant correlations were found between pretest scores on MA and EMC standardized scores,  $r(35) = .08, p > .05$ , nor between pretest scores MAAMCAS and EMC standardized scores,  $r(35) = -.01, p > .05$ . The posttest scores between MAS and EMC standardized scores,  $r(34) = -.08, p > .05$ , and between MAAMCAS and EMC standardized scores,  $r(34) = .26, p > .05$ , yielded similar results.

H8: *Scores on SRC of the BBCS-R (Bracken, 1998), namely, numbers/counting, sizes, comparisons, and shapes, will be positively correlated with scores on the EMC.*

Table 14 shows the correlations at the pre- and posttest between the mathematics-related BBCS-R subscales (numbers/counting, sizes, comparisons, and shapes) and the foci of the EMC (number, pattern, measurement, and shape and

Table 14

Correlations for Pretest (Posttest) Between BBCS-R Subscales and EMC Foci

	BBCS-R- Numbers/counting subscale	BBCS-R- Sizes subscale	BBCS-R- Comparisons subscale	BBCS-R- Shapes subscale
EMC- Number focus	.86** (.79**)	.35* (.43*)	.55** (.56**)	.75** (.36*)
EMC- Pattern focus	.56** (.48**)	.15 (.07)	.28 (.23)	.60** (-.14)
EMC- Measurement focus	.42* (.36*)	.13 (.08)	.22 (.41*)	.41* (.28)
EMC- Shape and space focus	.35* (.50**)	.00 (.13)	.21 (.28)	.39* (.25)

\*  $p < .05$

\*\*  $p < .01$



space). As a whole, the SRC standardized scores were positively correlated with the EMC standardized scores,  $r(35) = .86, p < .01$  at the pretest and  $r(35) = .61, p < .01$  at the posttest.

### Summary of Results

Internal consistency estimates for the EMC, MAS, MAAMCAS, and the BBCS-R were similar to past research. Although all these instruments appeared valid and reliable, no statistically significant differences were discovered between the intervention and comparison groups in EMC standardized posttest scores or in any of the EMC foci (number, measurement, pattern, and shape and space). There were statistically significant differences in EMC standardized posttest scores in the intervention groups if the group was split by activity level with children of high activity level parents scoring higher at the posttest on the EMC. There also were no statistically significant differences in attitude as measured by the MAS or the MAAMCAS by intervention and comparison groups. Correlational analyses did, however, confirm that the EMC and BBCS-R are related and that the BBCS-R mathematical subscales are also related to the EMC foci, suggesting that some multicollinearity might be present (e.g., EMC pattern focus and BBCS-R numbers/counting and shapes subscales; EMC number focus and BBCS-R numbers/counting, comparisons, and shapes subscales).

## CHAPTER V

## DISCUSSION

The purpose of this study was to address the role of formal and informal math instruction in the home on prekindergarten children's math development and the function of parental attitudes in relation to children's math development through application of Vygotsky's theory. Does parental instruction of math affect prekindergarten children's math performance? Are a mother's (or parents') attitudes about math and/or her attitudes about her child's ability to succeed in math related to the child's mathematical performance? Finally, is the EMC a valid measure to use to test prekindergarten children's math ability?

The efficacy of a mother-child math intervention developed by the present author was explored using the EMC. Research hypotheses suggested that the intervention group would score higher on the posttest on the EMC and on each focus in the EMC, namely, number, pattern, measurement, and shape and space. Results were not statistically significant and did not support these hypotheses. Research hypotheses also suggested that the changes in the MAS and the MAAMCAS scores would be larger for the intervention group than the comparison group and that the posttest MAS and MAAMCAS scores would predict EMC scores at the posttest. For both these attitudes-related hypotheses, results were not statistically significant. Finally, the last hypothesis suggested a relationship between the BBBS-R and the EMC. Overall, the BBBS-R and EMC appear to be measuring similar concepts but are not multicollinear. The remainder of this thesis will address the implications of the

validity of the EMC, note any implications for current research, discuss possible limitations of the study contributing to the neutral findings, and finally, submit implication for application.

### Implications of the Validity of the EMC

One of the ways in which this study adds to current research is that it expands current knowledge on measuring early childhood mathematics skills. No study to our knowledge has used a standardized test among prekindergarten children to measure math ability (not just numeracy ability). The EMC, which has been used extensively in Great Britain, lacked concurrent validity because it had not been correlated with any other early math test. Scores from the EMC were evaluated against scores from the SRC of the BBCS-R. There was a positive correlation between these two tests, which suggests that they are measuring similar concepts.

Unfortunately, breaking the SRC down into math components and comparing them to similar math components found in the EMC did not provide further insight into the EMC except in the category of number, which had a high correlation that can be identified as multicollinearity. The EMC number focus was also highly correlated with the SRC comparisons subscale and the shapes subscale. There also should have been a strong correlation between the measurement focus on the EMC and the comparisons subscale on the SRC because the EMC measurement focus used informal measurement with comparison terminology. Only at the posttest was there a

correlation that was statistically significant, yet the strength of the relationship was not large enough to show multicollinearity.

#### Implications for Current Research

The present study has supported many previous findings, has not supported at least two previous studies, and has added to current research. In accordance with the finding of Blevins-Knabe et al. (2000), the number of parent-child math activities was not related to math achievement. Although Blevins-Knabe et al. used the number of activities in which parents currently participate and not the number of activities in which parents participate after an intervention, the findings were similar. Future research should look more closely at the quality and type of interactions parents are having with their children. Are the activities developmentally appropriate? How much involvement is the parent having with the child? How much is the child encouraged to think and not just arrive at the correct response?

Surprisingly, although parents were taught in the math classes about making math interactions a part of their everyday lives, less than half of the parents applied the activities in their activity sessions to events in everyday life. Among those parents who did apply the math activities to everyday life, only a small percentage of the total activities completed had anything to do with everyday life. This finding supports Anderson (1997), who noted very few math connections to everyday life when she tape recorded four 15-minute math sessions between parents and their prekindergarten children.

This current study also supports findings by Musun-Miller et al. (1998). Using a different measure than the MAS, Musun-Miller et al. (1998) found that parents' attitudes about math were not related to children's math achievement, as measured by the TEMA-2. This study also suggests that a child's math achievement, as measured by the EMC, is unrelated to a parent's attitudes about math, even after an intervention that may have affected the parent's attitudes about math.

This study does not support the findings of Young-Loveridge (1989), who noted a positive correlation between mother's expectations for the child and math achievement score. The current study noted no relationship between the attitudes parents had about their children's abilities as measured by MAAMCAS and math achievement as measured by EMC. Perhaps these studies do not support each other because the mother's expectations by Young-Loveridge (1989) do not measure the same construct as MAAMCAS. Future research should explore the relationship between these two constructs.

The present study expands the current knowledge base on math development in young children. The results of this study suggest that parents' attitudes about math are not related to parents' attitudes about their children's math abilities. This notion suggests that, though parents may not feel good about math, parents may still have a positive attitude about their child's ability to succeed in math. This relationship should be explored further in future research.

### Limitations

The impact of this intervention did not follow the expected path. Therefore, implications to the field of child development and limitations to the study must be explored.

First, interventions often face difficulties with time limits (Weissberg & Greenberg, 1997). Was the intervention long enough? Because there was not enough time to visit parents who did not complete the parent questionnaire during the assessments, the questionnaires were mailed, which may have made parents feel less connected to the study or made them have incorrect understanding of the study requirements. Will the results not show up until later? For instance, will the results of this study be more clear once the children in the intervention group start school? Parental compliance to hold activities three times per week for 3 months was difficult. How compliant would parents be to continuing to do activities three times per week for a longer amount of time? Four months was long enough for Starkey and Klein (2000) to see results with their intervention, but their intervention was slightly different. Starkey and Klein (2000) involved low SES children in their study and low SES children have been shown to improve more than mid-SES children (Klein & Starkey, 2000). The participants in Starkey and Klein's study were not required to hold activities with their children outside of class. Additionally, all the children in Starkey and Klein's intervention were African American or Mexican American and may interpret the intervention or test differently because of their culture (Ginsberg et

al., 1997). Therefore, Starkey and Klein's results may not be applicable to a White sample.

Another limitation was that each mother was allowed to discover her child's developmental level and then structure an activity on a math related topic. Perhaps parents need more direct instruction and need to work on the same topic to see improvement as a group. Starkey and Klein (2000) avoided this problem by teaching the parents how to do one activity, then giving the parents the materials in class to do the activities. One of the weaknesses on this type of program is that parents do not learn how to recognize math opportunities in their daily lives nor do they know any way to teach except what they have learned in class. Parents were allowed to check out math manipulatives from a library, but Starkey and Klein did not know how or whether these items were used.

One of the biggest problems with the current study was that parents did not complete the intervention as designed. Attendance at the classes was low despite opportunities for make-up classes and reminders sent out 1 week prior to the class. The average number of activity logs completed was also low. Additionally, three of the mothers chose to do workbook pages without any type of manipulatives. Workbook pages were not part of the class and were not discussed in the class. Surprisingly, despite emphasis on math in everyday life during class discussions, mothers only connected everyday life experiences in a small percentage of the activity sessions. Perhaps if parents were rewarded with lunch as Klein and Starkey's (2000) participants were or with money or gift certificates, participants would have complied

with the requirements of the study more fully.

The present study was built on a strong foundation of theory and previous findings. The intervention was implemented by trained, educated persons. The classes were based on developmentally appropriate practice which focused on each child's individualized learning pathway. These characteristics are fundamental in high quality intervention (Weissberg & Greenberg, 1997). Therefore, future research should focus on ways to increase parental compliance with intervention requirements, to evaluate the quality of parent-child math interactions, and to assess children throughout a longer intervention to discover when the results surface.

#### Implication for Application

As discussed in the limitations section, parents may need more direct instruction to hold math activities with their children. This direct instruction need not be structured to teach to a test. Feedback from the intervention and comparison classes suggested that parents want more direct instruction because a few parents commented that they would have liked prepared lesson plans of activities they could do with their children.

Prepared lesson plans for the activities could easily be developed using everyday materials. A section on the lesson plans could be added that would allow parents to teach to their child's developmental level. This section would be structured to allow parents to increase or decrease the difficulty level. The quality of the parent-child math interactions could also be more controlled using prepared lesson plans



because the quality would be written into the lesson plans. A word list of math terms parents could use in the activity could also be included to pair the informal math (using concrete materials) with formal math (using math terminology). (See Appendix W for a sample activity lesson plan.) Once parents had more experience with teaching their children in this manner, they could move on to developing activities on their own and looking for opportunities in everyday life.

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APPENDIXES

Appendix A. Sign-Up Sheets

*Parents of preschool children, this opportunity must not be overlooked!*

**DO YOU HAVE A CHILD BORN BETWEEN  
DEC. 1, 1995 AND SEPT. 1, 1996? (OR DO YOU KNOW SOMEONE)**

**WE NEED YOUR HELP!!! (IN A RESEARCH PROJECT)**

I, Monica Blanch, am a graduate student working on a Master of Science degree in Family and Human Development. I am interested in children's development when parents participate as teachers of their young children. *I will not be assessing or "labeling" you as a good parent or a bad parent.* Rather, I will be looking at the ways that parents teach young children and the materials and strategies that parents find most useful in their role as teachers.

**Through this study, you will:**

- ▶ meet monthly for an hour,
- ▶ learn more about how you can help your child develop more successfully,
- ▶ receive lots of fun ideas about inexpensive ways you can promote your child's learning just by using materials at home,
- ▶ develop a network with other parents of preschool age children,
- ▶ receive a monthly newsletter which will answer your questions and give you more simple ideas for working with your children,
- ▶ enjoy three 10 minute, game-like activity sessions per week. These sessions will include activities like this...

**Funny Sounds and Words** (Taken from America Reads Challenge: Read\*Write\*Now!)

**You'll need:** *A favorite book of stories.*

**What to do:** *Choose a story to read to your child. As you read the story, use your voice to draw attention to a special, new word. You can say the word in a funny way, sing it, say it loud or soft, and even make funny faces when you say it. Show your child how to use the word throughout the day. The next time you read together, choose a new word.*

Your participation will help all of us in child development learn more about the ways that parents can be effective teachers of their young children. This project will begin **January 2001** and will end **April 2001**.

My major professor is Dr. Ann M. B. Austin, Professor of child Development and Associate Dean of the College of Family Life. If you are interested in learning more about this study and possibly participating, please contact me at 797-3925 (leave a message) and/or sign below, and I will send you more information. If you know of anyone else who would be interested, sign them up too, and we will contact them via letter. ***Thank you so much!***

<u>Name</u>	<u>Address</u>	<u>Phone Number</u>	<u>Do you own a tape recorder?</u>
1.			
2.			
3.			
4.			
5.			
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18.			
19.			
20.			

Appendix B. Phone Dialogue for Participants Who Signed-Up

### Phone Questions for Women Who have Signed the Sign-up-for-more-info Sheet

Name:  
Phone:

Address:

Hi, my name is \_\_\_\_\_. A few of weeks ago your Relief Society President was contacted to find people who would be interested in learning more about a study for parents of preschoolers. I would like to thank you for your interest in this research project.

▶ Do you have any questions?

▶ I'd like to review the criteria with you:

We are including children born between **Sept 95 and Sept 96**. According to the sign-up sheet your child is within this range (*or close with-in 3 months of Sept 96 or one month of Sept 95*). (*If they have more than one child fitting within the criteria, flip a coin for whether you choose older or younger and do this for each choice that you need to make.*)

What is your child's birth date? \_\_\_\_\_

Was the child born at term or before? (If the child would still be in the age range going from the due date, then include them in the study. If not, apologize and explain that we are looking for children who would still fit in the age range if they were born on their due date.)  
\_\_\_\_\_

▶ Do you have any friends or sisters or sisters-in-laws whom you would like to include in this project?

Would you give me their name and phone number so I might call them please? Please realize that by giving me their contact information it doesn't mean that they have to participate. It just means that I'll call them and ask them if they would like to participate. Also, anyone may withdraw from this project at any time without penalty.

Name:  
Phone number:

Name:  
Phone number:

- ▶ I need to ask you some question in order to get a better feel for your schedule. It is important to schedule meetings that fit in with your schedule because you will need to attend all meetings.
  - What day/night is best?
  - Would it be better to have meetings during the day, at night, or on a Saturday?
  - Is there a specific time which would work best?

I will be contacting you within the next two weeks to let you know when the study will begin.

- ▶ Would you be able to find someone to care for your children while you are in the meeting? \_\_\_\_\_
- ▶ Do you own a tape recorder? \_\_\_\_\_
- ▶ I just wanted to let you know what will be involved in the study.
  1. You will be asked to attend one introductory meeting and one monthly meeting for three months. These meetings will last approximately one hour and will receive information about your child's development and ways to enhance their development.
  2. Your child will be assessed at the beginning of the study and at the end to determine their developmental level. You will receive these results at the end of the study.
  3. You will also be asked to have triweekly activity sessions with your child at your convenience.

We are very excited to be working with you!

You will enjoy such benefits as:

1. Ideas of activities to do with your child,
2. Knowledge about what your child can learn at their age,
3. Something to take home from each meeting to do with your child, and
4. Fellowship with other mothers of preschoolers.

Thank you again for your interest. I will be in contact with you again in the next couple of weeks.

**LOG**

Appendix C. Informed Consent



**Informed Consent**  
**Welcome Home:**  
**The Role of Parents as Formal Instructors of Preschool Children**

Dear Parent,

**Introduction/Purpose.** The purpose of this letter is to inform you of an *exciting* new research study focusing on children's development and parent-child interactions and to invite your participation in it. The project title, "Welcome Home," was coined to express the important role parents play in children's lives. Your participation will allow us to learn more about the important process of child development within the home. "Welcome Home" is directed by Ms. Monica J. Blanch, a graduate student working with Dr. Ann M. B. Austin in the Department of Family and Human Development at Utah State University. You have been asked to take part because you have a child who is 4 or 5 years old. Approximately 40 participants will be involved in this study in total.

**Procedures.** If you agree to participate in "Welcome Home," two developmental assessments will be made of your child's level of cognitive functioning. These assessments are not IQ tests. Rather their purpose is to determine the level of problem solving your child is currently using. Children usually enjoy this assessment because it is presented in a game-like format. For example, the child may be asked to point to the letter "A" on a page of a variety of typed letters. The assessments will take approximately 35-40 minutes and will be conducted by Dr. Austin, Ms. Blanch, or someone trained by them. We will share all results of these assessments with you and will answer any questions you have on your child's development. Our sole purpose in "Welcome Home" is to learn how to better promote children's well-being. Thus, we want the entire process of this study to be enjoyable and useful to you.

You will be asked

1. to participate in an hour long, monthly parent information session,
2. to complete an attitudes questionnaire about promoting child development,
3. to complete three ten minute parent-child game-like sessions per week for 18 weeks as instructed by Ms. Blanch,
4. to log these interactions by tape recording the sessions and completing a checklist, and
5. to give feedback throughout these procedures.

Additionally, Monica Blanch and/or Dr. Ann Austin will call some (four to six) parents to set up an appointment to observe one of the game playing sessions.

**New Findings.** During the course of this study, you will be informed of any significant new findings (either good or bad), such as changes in the risks or benefits resulting from participation in the research, or new alternatives to participation which

**Informed Consent**  
**Welcome Home:**  
**The Role of Parents as Formal Instructors of Preschool Children**

might cause you to change your mind about continuing in the study. If new information is provided to you, your consent to continue participating in this study will be reobtained.

**Risks.** There are no significant added risks by participating in this study.

**Benefits.** There may be a direct benefit to you from "Welcome Home" as you learn ways to teach your preschooler more effectively. The investigator, however, may learn more about the reliability and validity of two developmental assessments for preschool children, more about children's development, and more about current developmental theory.

**Explanation & offer to answer questions.** Monica Blanch has explained this study to you and answered your questions. If you have other questions or research-related problems, you may reach Professor Ann M. B. Austin at 797-1527 or Monica Blanch at 797-3925.

**Voluntary nature of participation and right to withdraw without consequence.**

Participation in research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence or loss of benefits.

**Confidentiality.** Research records will be kept confidential. You will be assigned a code number to put on the top of all questionnaires, documents, and audio tapes. You will also be asked to avoid using any identifying information on the tape recording. Only Monica Blanch and Dr. Ann Austin will have access to the data, and it will be kept in a locked file cabinet in a locked room. The data will be kept for up to six months and then destroyed.

**IRB Approval Statement.** The Institutional Review Board (IRB) for the protection of human subjects at Utah State University has reviewed and approved this research project. If you have any concerns or questions about this study, you may call the IRB office at 797-1180.

**Copy of consent.** You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

*We are so excited about this opportunity to share with you , "Welcome Home." We hope that you will take advantage of this invaluable experience and consent to work with us!*

**Informed Consent**  
**Welcome Home:**  
**The Role of Parents as Formal Instructors of Preschool Children**

**Investigator Statement.** "I certify that the study has been explained to the individual identified as the subject in the next section, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised, have been answered."

\_\_\_\_\_  
Dr. Ann M. B. Austin  
Principal Investigator  
797-1527

\_\_\_\_\_  
Monica J. Blanch  
Student Researcher  
797-3925

**Signature of Subject.** "By signing below, I agree to participate."

\_\_\_\_\_  
Parent's signature

\_\_\_\_\_  
Date

Appendix D. Phone Dialogue for Referred Participants

## Referral Call sheet

Name:  
Phone:

Address:

Hi, my name is \_\_\_\_\_. I talked to \_\_\_\_\_ (referred by Name) about a study at USU conducted by Dr. Ann M. B. Austin and me for my Graduate thesis in Family and Human Development. She suggested that you might be interested in participating in this research project for parents of preschoolers. Would you like to hear more about it?

- ▶ First there are certain criteria, you must meet to be eligible. I'd like to review the criteria with you.  
We are including children born between **Dec 95 and Sept 96**. According to the sign-up sheet your child is within this range (*or close with-in 3 months of Sept 96*). (*If they have more than one child fitting within the criteria, flip a coin for whether you choose older or younger and do this for each choice that you need to make.*)

- What is your child's birth date? \_\_\_\_\_
- Was the child born at term or before? (If the child would still be in the age range going from the due date, then include them in the study. If not, apologize and explain that we are looking for children who would still fit in the age range if they were born on their due date.)  
\_\_\_\_\_

- ▶ I just wanted to let you know what will be involved in the study.
  1. You will be asked to attend one introductory meeting and one monthly meeting for three months. These meetings will last approximately one hour and will receive information about your child's development and ways to enhance their development.
  2. Your child will be assessed at the beginning of the study and at the end to determine their developmental level. You will receive these results at the end of the study.
  3. You will also be asked to have triweekly activity sessions with your child at your convenience.

You will enjoy such benefits as:

1. Ideas of activities to do with your child,
2. Knowledge about what your child can learn at their age,
3. Something to take home from each meeting to do with your child, and
4. Fellowship with other mothers of preschoolers.

- ▶ Does this study sound like something that you would like to participate in? (NO!----)If not, do you know someone that might be interested in this study? Thank you for your time. Hope that you have a nice day. (YES!----)We are very excited to be working with you!
- ▶ Do you have any questions?

▶ **Meeting Times**

I need to ask you some question in order to get a better feel for your schedule. It is important to schedule meetings that fit in with your schedule because you will need to attend all meetings.

- What day/night is best?
  - Would it be better to have meetings during the day, at night, or on a Saturday?
  - Is there a specific time which would work best?
- ▶ Would you be able to find someone to care for your children while you are in the meeting? \_\_\_\_\_
  - ▶ Do you own a tape recorder? \_\_\_\_\_
  - ▶ Now I need to set up an appointment for my assessors to come to your home and assess your child's developmental level. There are two game-like assessments:
    - ▶ The EMC which takes approximately 30 minutes and will be given by me or someone in Family and Human Development trained by me
    - ▶ The Bracken which takes approximately 15 minutes and will be given by me, my professor (Dr. Ann Austin) or someone in FHD trained by me.
  - ▶ Do you have any friends or sisters or sisters-in-laws whom you would like to include in this project?
    - Would you give me their name and phone number so I might call them please? Please realize that by giving me their contact information it doesn't mean that they have to participate. It just means that I'll call them and ask them if they would like to participate. Also, anyone may withdraw from this project at any time without penalty.

Name:  
Phone number:

Name:  
Phone number:

Thank you again for your interest.

Appendix E. Training for EMC

**Early Math Concepts (EMC)– Training**  
May 2001

***What is the EMC?***

- Tests early math ability
- Materials in each kit
  - ✓ Test guide
  - ✓ Teacher's guide
  - ✓ Administration Dialogue
  - ✓ pupil booklets
  - ✓ 8 cubes
  - ✓ 8 pennies
  - ✓ pencil
  - ✓ stickers for rewards
  - ✓ clean-ups

***How do I give the EMC?***

- YOUR RESPONSIBILITIES
  - Assess 38 children (20 in Hyrum, UT and 18 in Weston, ID). Twenty percent of the assessments will be observed by the trainer.
  - Score each assessment.
  - Record raw score on the back of the pupil booklet.
  - Return all pupil booklets in an envelop to Monica Blanch.
- THE ASSESSMENT
  - Seat the child in a quiet room or quiet area away from distractions.
  - Complete the back of the pupil booklet.
  - Tell the child: "I am going to do some fun activities with you today. You do not have to know everything; you just have to do your best, and it is okay if you tell me that you don't know the answer. I can repeat any of the questions, but I cannot give hints."
  - Follow the Administration Dialogue as closely as possible.
  - Do not tell them whether they got the question right or wrong.
  - The child can write or you can write for them under their direction on items 34-36, 39-55. Do not lead the child.
  - Record the child's first answer, even if the answer doesn't make sense, unless the child corrects himself.
  - Clean all items after assessment.
- SCORING
  - Use the marking key on page 29 of the teacher's guide to score items.
  - Record the raw score on the back of the pupil's booklet.



Appendix F. EMC Standardized Assessment Dialogue

## Administration Dialogue

*Pupil's Booklet page 3*

- |    |   |   |
|----|---|---|
| 1. | <b>Count out loud as far as you can, starting from one.</b>   | <i>Record in the blue rectangle the highest number that the child reaches correctly in sequence.</i>    |
| 2. | Choose a number that precedes the child's correct answer to question 1 by two or three: for example, if the child correctly reached 12 in question 1 then choose the number 9 or 10. Tell the child your chosen number... | <i>Record your chosen number in the blue rectangle where it says, 'My teacher told me this number.'</i> |
|    | <b>I'm thinking of the number _____ (see above).</b>  |   |
|    | <b>What number comes before _____ (see above)?</b>  | <i>Record the child's answer in the blue rectangle.</i>   |
| 3. | <b>What number comes after _____ (see above)?</b>   | <i>Record the child's answer.</i>   |

*Pupil's Booklet page 4, 5*

- |    |   |   |
|----|---|---|
| 4. | Show the child the butterflies. <b>What are these? Right, they are butterflies. How many big butterflies are there?</b> | <i>Record the child's answer in the blue rectangle.</i> |
| 5. | <b>How many small butterflies are there?</b>  | <i>Record the child's answer in the blue rectangle.</i> |
| 6. | <b>How many big and small butterflies are there altogether?</b>   | <i>Record the child's answer in the blue rectangle.</i> |

*Pupil's Booklet page 6*

- |    |   |   |
|----|---|---|
| 7. | <b>How many stars are there in the box?</b> | <i>Write the child's answer in the rectangle.</i> |
| 8. | <b>How many stars are there in the box?</b> | <i>Write the child's answer in the rectangle.</i> |

*Pupil's Booklet page 7*

9. What number is this? *Tick the number if correct.*
10. What number is this? *Tick the number if correct.*
11. What number is this? *Tick the number if correct.*
12. What number is this? *Tick the number if correct.*

*Pupil's Booklet page 8*

13. What is the name of this shape? *Write the child's answer under the shape.*
14. What is the name of this shape? *Write the child's answer under the shape.*
15. What is the name of this shape? *Write the child's answer under the shape.*

*Pupil's Booklet page 9, 10, 11*

16. Point to a triangle. *Mark on the shape that the child points to.*
17. Point to a circle. *Mark on the shape that the child points to.*
18. Point to a square. *Mark on the shape that the child points to.*

*Pupil's Booklet page 12*

You will need 8 cubes.

19. Give the child 5 cubes. **Will you build me a tower with these cubes? How many cubes are there in the tower?** *Record the child's answer in the blue rectangle.*
20. Give the child 3 more cubes. **How many cubes would be in your tower if you added these in your tower?** *Record the child's answer in the blue rectangle.*

***Pupil's Booklet page 13***

You will need 8 pennies. Show the collection of coins to the child. What are these? Right, these are pennies.

- |  |   |
|--|---|
| 21. Give the child 8 pennies. <b>How many pennies are there?</b>   | <i>Record the child's answer in the blue rectangle.</i> |
| 22. <b>How many pennies will you have left if you have 8 pennies and spend 2 of them?</b>  | <i>Record the child's answer in the blue rectangle.</i> |
| 23. Remove 2 pennies so that the child now has a total of 6. <b>How many pennies do you have left if you have 6 pennies and spend 3 of them?</b> | <i>Record the child's answer in the blue rectangle.</i> |

***Pupil's Booklet page 14***

- |   |   |
|---|---|
| 24. Point to the first box. <b>Point to the number eight in this box.</b> | <i>Circle the number the child points to.</i> |
| 25. Point to the second box. <b>Point to the number six in this box.</b>  | <i>Circle the number the child points to.</i> |
| 26. Point to the third box. <b>Point to the number seven in this box.</b> | <i>Circle the number the child points to.</i> |
| 27. Point to the fourth box. <b>Point to the number nine in this box.</b> | <i>Circle the number the child points to.</i> |

*Pupil's Booklet page 15*

- |     |   |   |
|-----|---|---|
| 28. | Point to the bigger of the two numbers. | <i>Circle the number the child points to.</i> |
| 29. | Point to the bigger of the two numbers. | <i>Circle the number the child points to.</i> |
| 30. | Point to the bigger of the two numbers. | <i>Circle the number the child points to.</i> |
| 31. | Point to the bigger of the two numbers. | <i>Circle the number the</i>                  |

*Pupil's Booklet page 16, 17*

- |     |                              |
|-----|------------------------------|
| 32. | Point to the biggest number. |
| 33. | Point to the biggest number. |

*Pupil's Booklet page 18*

These are snails. I'm going to show you what we are going to do next then I want you to try doing the same thing. Point to the first ring. How many snails are in this ring? Right, there are two snails. Can you find the number two on the side of the page? Draw a line between the two snails and the number two. Good job. (If the child doesn't want to draw, then you may draw the line for him.)

Let's try another one. Point to the second ring. How many snails are in this ring? Right, there are four. Can you find the number four on the side of the page? Draw a line between the four snails and the number four. Great. Now you try it by yourself.

- |     |   |                       |
|-----|---|-----------------------|
| 34. | Point to the next ring. How many snails are in this ring? <u>Do not confirm the answer.</u> Draw a line between the snails in this ring and the correct number at the side of the page. | <i>Child records.</i> |
| 35. | Point to the next ring. How many snails are in this ring? <u>Do not confirm the answer.</u> Draw a line between the snails in this ring and the correct number at the side of the page. | <i>Child records.</i> |
| 36. | Point to the next ring. How many snails are in this ring? <u>Do not confirm the answer.</u> Draw a line between the snails in this ring and the correct number at the side of the page. | <i>Child records.</i> |

*Pupil's Booklet page 19, 20*

- |     |  |                                       |
|-----|--|---------------------------------------|
| 37. | Point to the box that has four stars.  | <i>Draw an "x" in the chosen box.</i> |
| 38. | Point to the box that has eight stars. | <i>Draw an "x" in the chosen box.</i> |

*Pupil's Booklet page 21, 22*

- |  |   |
|--|---|
| 39. <b>These two boxes contain buttons. Show me which box has more buttons in it.</b> (Child may write the checkmark if she desires.)  | <i>Put a checkmark in the chosen box.</i>               |
| 40. <b>How many more buttons are in this box</b> (point to the box that has the most number buttons) <b>than this box</b> (point to the box that has the least number of buttons)? | <i>Record the child's answer in the blue rectangle.</i> |
| 41. <b>These two boxes contain stars. Show me which box has more stars in it.</b> (Child may write the checkmark if she desires.)  | <i>Put a checkmark in the chosen box.</i>               |
| 42. <b>How many more stars are in this box</b> (point to the box that has the most number stars) <b>than this box</b> (point to the box that has the least number of stars)?       | <i>Record the child's answer in the blue rectangle.</i> |
| 43. <b>These two boxes contain flowers. Show me which box has more flowers in it.</b> (Child may write the checkmark if she desires.)  | <i>Put a checkmark in the chosen box.</i>               |
| 44. <b>How many more flowers are in this box</b> (point to the box that has the most number flowers) <b>than this box</b> (point to the box that has the least number of flowers)? | <i>Record the child's answer in the blue rectangle.</i> |

*Pupil's Booklet page 23*

(If the child does not wish to write, invite the child to point to the box with the most items.)

- |   |                       |
|---|-----------------------|
| 45. <b>These three boxes contain buttons. Put a checkmark by the box that has the most buttons in it.</b> | <i>Child records.</i> |
| 46. <b>These three boxes contain stars. Put a checkmark by the box that has the most stars in it.</b>     | <i>Child records.</i> |
| 47. <b>These three boxes contain flowers. Put a checkmark by the box that has the most flowers in it.</b> | <i>Child records.</i> |

*Pupil's Booklet page 24, 25*

\*\* If the child does not wish to draw, draw one button at a time in the box and say, "Do you want me to draw another button?" Stop when the child instructs you to stop.

48. **This box contain ten buttons. Please draw five buttons in each of the two smaller boxes.** *Child or teacher records.*
49. **This box contains nine buttons. Please draw three buttons in this box and six buttons in the other box.** *Child or teacher records.*

*Pupil's Booklet page 26, 27, 28, 29*

\*\* If the child doesn't want to draw say, "Point to what you want me to draw and where you want me to draw it, and I will draw for you."

\*\* If the child's shapes are unclear, ask the child what the shape is or ask her to point to the shape she is drawing. Make a mark in the box if the pattern has the correct shapes in the correct order.

50. **Look at this pattern. Can you copy this pattern here?** *Child records.*  
Point to the space in the box underneath the existing pattern.
51. **Look at this pattern. Will you continue the pattern to the end of the box?** *Child records.*
52. **Look at this pattern. Can you copy this pattern here?** *Child records.*  
Point to the space in the box underneath the existing pattern.
53. **Look at this pattern. Will you continue the pattern to the end of the box?** *Child records.*

*Pupil's Booklet page 30, 31*

54. **This is a picture of a worm. Will you draw a worm that is longer than this worm?** There is space underneath the worm in the box to do so. *Child records.*
55. **This is a picture of a worm. Will you draw a worm that is shorter than this worm?** There is space underneath the worm in the box to do so. *Child records.*



Appendix G. Meeting Reminders

Just a reminder...

Come to the 2nd meeting of  
**Welcome Home**



*A research program for parents of preschool aged children!*

Date: Friday, February 2, 2001

Time: 1:00 to 2:00 pm

Place: Hyrum Civic Center



Please remember to bring your completed audio tapes and math logs to the meeting. We will be holding a raffle for GREAT prizes based on the number of math logs we have received before Feb. 2, so make sure you are up to date! Also, we will have a couple volunteers available to watch your children if you are unable to find a babysitter. If you have any questions, call Monica at 797-3925.

Just a reminder...

Come to the *last* meeting of  
**Welcome Home**



*A research program for parents of preschool aged children!*

Date: Friday, April 6, 2001

Time: 1:00 to 2:00 pm

Place: Hyrum Civic Center



Please remember to bring your completed audio tapes and math logs to the meeting. We will be holding a raffle for GREAT prizes based on the number of math logs we have received before April 5, so make sure you are up to date! Also, we will have a couple volunteers available to watch your children if you are unable to find a babysitter. If you have any questions, call Monica at 797-3925. We hope to see you all there for the special final meeting!

*Just a reminder about our next meeting...*

**Welcome Home**

*A program for parents & their preschoolers*



**Date:** Friday, March 2, 2001

**Place:** Hyrum Civic Center

**Time:** 1 pm

\*\* Child care will once again be provided for parents who are unable to find someone to watch their children during the meetings.

\*\* We will also be holding another raffle for great prizes based on the number of math logs I have received by Thursday, March 1, 2001.

\*\* If you have any questions, call Monica Blumh at 797-3925 or e-mail her at mjbhunc@hohmail.com

Just a reminder about our next meeting...

## Welcome Home

A program for parents & their preschoolers



Date: **Wed., May 2, 2001**  
Place: **Weston L.D.S. Church**  
Time: **3:30 - 4:30 pm**

\*\* Child care will once again be provided for parents who are unable to find someone to watch their children during the meetings.

\*\*We will also be holding another raffle for great prizes based on the number of psychosocial logs I have received by Tuesday, May 1, 2001.

\*\* If you have any questions, call Monica Blanch at 797-3925 or e-mail her at [nyblanch@hotmail.com](mailto:nyblanch@hotmail.com)



Please remember to bring your completed audio tapes and psychosocial logs to the meeting. We will be holding a raffle for GREAT prizes based on the number of psychosocial logs we have received before April 2, so make sure you are up to date! Also, we will have a couple volunteers available to watch your children if you are unable to attend. If you have any questions, call Monica at (843) 797-3925.

Date: **Wednesday, April 4, 2001**  
Time: **3:30 to 4:30 pm**  
Place: **LDS Church in Weston**

Just a reminder...  
Come to the 2nd meeting of  
**Welcome Home**  
 A research program for parents of preschool aged children!



Please remember to bring your completed audio tapes and psychosocial logs to the meeting. We will be holding a raffle for GREAT prizes based on the number of psychosocial logs I have received before June 3, so make sure you are up to date! Also, there will be a couple volunteers available to watch your children if you are unable to attend. If you have any questions, call Monica at 797-3925. Thank you and you all there for the successful final meeting!

Date: **Wednesday, June 6, 2001**  
Time: **3:30 - 4:30 pm**  
Place: **Weston LDS church**

Just a reminder...  
Come to the last meeting of  
**Welcome Home**  
 A research program for parents of preschool aged children!

Appendix H. Testing Schedule

## SAMPLE TESTING SCHEDULE

Time	EMC- 1	EMC- 2	Bracken
9:00 - 9:20	A	B	C
9:20 - 9:40	A	B	D
9:40 - 10:00	C	D	A
10:00 - 10:20	C	D	B
10:20 - 10:40	E	F	G
10:40 - 11:00	E	F	H
11:00 - 11:20	G	H	E
11:20 - 11:40	G	H	F
11:40 - 12:00	J		I
12:00 - 12:20	J	I	(K)
12:20 - 12:40	(K)	I	J
12:40 - 1:00	(K)		

<b>A</b>	9:00 - 10:00	
<b>B</b>	9:00 - 10:20	
<b>C</b>	9:00 - 10:20	
<b>D</b>	9:20 - 10:20	
<b>E</b>	10:20 - 11:20	
<b>F</b>	10:20 - 11:40	
<b>G</b>	10:20 - 11:40	
<b>H</b>	10:40 - 11:40	
<b>I</b>	11:40 - 12:40	
<b>J</b>	11:40 - 12:40	
<b>(K)</b>	12:00 - 1:00	

Appendix I. Parent Questionnaire



Date: \_\_\_\_\_ Subject # \_\_\_\_\_

6. Please check the highest education level that the child's *mother* has completed.

- 1-8th grade       vocational or some college       graduate or professional school  
 9-11 grade       high school graduate or GED       college/university graduate

7. Please check yearly family income:

- less than \$4,999       \$10,000-\$14,999       \$30,000-\$44,999       \$60,000+  
 \$5,000-\$9,999       \$15,000-\$29,999       \$45,000-\$59,999

6. Which best describes the ethnic background of your child?

- White/Anglo       African American/Black       Asian, Pacific Islander  
 Latino/Hispanic       American Indian, Alaskan Native       Other \_\_\_\_\_

***Parental Attitudes***

For the following questions, the term "child" refers to your Pre-K child. Please use a scale of 1 to 5 where 1 = strongly agree; 2 = agree; 3 = undecided; 4 = disagree; 5 = strongly disagree

***My Attitudes***

When I was in school, I was at ease in math classes.	1	2	3	4	5
When I was in school, I was at ease in reading/literature classes.	1	2	3	4	5
Mathematics usually makes me feel uncomfortable and nervous.	1	2	3	4	5
Reading usually makes me feel uncomfortable and nervous.	1	2	3	4	5
Mathematics makes me feel uncomfortable, restless, irritable, and impatient.	1	2	3	4	5



Date: \_\_\_\_\_ Subject # \_\_\_\_\_

*Parental Attitudes cont.*—For the following questions, the term “child” refers to your Pre-K child. Please use a scale of 1 to 5 where 1 = strongly agree; 2= agree; 3=undecided; 4=disagree; 5=strongly disagree

Reading makes me feel uncomfortable, restless, irritable, and impatient. 1 2 3 4 5

I get a sinking feeling when I think of trying math problems. 1 2 3 4 5

I get a sinking feeling when I think of reading. 1 2 3 4 5

Mathematics makes me feel uneasy and confused . 1 2 3 4 5

Reading makes me feel uneasy and confused. 1 2 3 4 5

*My Attitudes about Child's Abilities*

I think that mathematics tasks (i.e. counting, recognizing numbers and shapes, measuring) are some of the most important tasks with which my child should be familiar to be prepared for school. 1 2 3 4 5

I think that pre-reading tasks (i.e. knowing the names and sounds of letters) are some of the most important tasks with which my child should be familiar to be prepared for school. 1 2 3 4 5

I have strongly encouraged my child to do well in early mathematics tasks (i.e. counting, recognizing numbers and shapes, measuring) to prepare for school. 1 2 3 4 5

I have strongly encouraged my child to do well in pre-reading tasks (i.e. knowing the names and sounds of letters) to prepare for school. 1 2 3 4 5

I have always been interested in my child's progress in mathematics tasks (i.e. counting, recognizing numbers and shapes, measuring) in preparing for school. 1 2 3 4 5

I have always been interested in my child's progress in pre-reading tasks (i.e. knowing the names and sounds of letters) in preparing for school. 1 2 3 4 5

Date: \_\_\_\_\_ Subject # \_\_\_\_\_

*Parental Attitudes cont.--For the following questions, the term "child" refers to your Pre-K child. Please use a scale of 1 to 5 where 1 = strongly agree; 2= agree; 3=undecided; 4=disagree; 5=strongly disagree*

I think my child is the kind of person who could do well in mathematics tasks (i.e. counting, recognizing numbers and shapes, measuring) once he/she starts Kindergarten. 1 2 3 4 5

I think my child is the kind of person who could do well in pre-reading tasks (i.e. knowing the names and sounds of letters) once he/she starts Kindergarten. 1 2 3 4 5

As long as my child passes math when he/she starts school, I don't care how my child does in math. 1 2 3 4 5

As long as my child passes reading when he/she starts school, I don't care how my child does in reading. 1 2 3 4 5

I think my child needs to know just a minimum amount of math tasks (i.e. counting, recognizing numbers and shapes, measuring) to be prepared for school. 1 2 3 4 5

I think my child needs to know just a minimum amount of pre-reading tasks (i.e. knowing the names and sounds of letters) to be prepared for school. 1 2 3 4 5

I have shown no interest in whether my child can complete mathematics tasks (i.e., counting, recognizing numbers and shapes, measuring) before he/she starts school. 1 2 3 4 5

I have shown no interest in whether my child can complete pre-reading tasks (i.e. knowing the names and sounds of letters) before he/she starts school. 1 2 3 4 5

Appendix J. Memo for Informed Consent

February 22, 2001

Dear Parent,

Recently, you accepted an invitation to participate in my research study, entitled, "Welcome Home," for mothers of preschool aged children born in 1996. I am very excited to be working with you! Enclosed you will find a parent questionnaire and two informed consent forms which will tell you more about the study I am conducting. Please complete the parent questionnaire and sign one of the informed consent forms and return them in the enclosed envelop within the next week. The other copy of the informed consent form is for your records; you may keep it.

I will be contacting you within the next two weeks to let you know when the meetings will begin. I will also notify you at that time where the meetings will be held. I have already started completing the game-like assessments at some of the local preschools. Right now, I am working to locate twenty mothers of preschool aged children in your area who are willing to participate in this study. If you have any suggestions for possible participants or if you have any questions, please contact me via phone at (435) 797-3925 or via e-mail at [mjblanch@hotmail.com](mailto:mjblanch@hotmail.com).

Thank you so much for your willingness to help! This work is important!

Sincerely,

Monica Blanch  
Graduate Student in Family & Human Development  
Utah State University

Enclosures/3/

Appendix K. Final Memo to Parent Participants

# Memo

**To:** <Parent Participant's name>  
**From:** Monica Blanch, FHD Graduate Student, Welcome Home research project  
**Date:** April 27, 2001  
**Subject:** Wrapping Up

The time has arrived for wrapping up the Welcome Home research project. Your help and support is greatly appreciated. I have finally found and trained new assessors, so the final assessment phase is ready to begin. I will be contacting you within the next week to set up assessment times. I hope you will be patient as I attempt to coordinate schedules.

Attached, you will find two forms you will need to complete and return in the enclosed envelope within the next week. The first form is a final attitudes questionnaire. Beside your name on this form, please indicate whether your Pre-K child is currently enrolled in preschool (or has been during the study). The second form, an evaluation form, is for my benefit only. ***Please do not put your name on the evaluation form.*** Beside your name, write the number of meetings you attended. Complete the evaluation form as honestly as possible so that I will know how this project could be improved.

Thanks again for all your help! I have learned so much. I will be contacting you within a month after the testing is completed with the results of the assessments.

Sincerely,

Monica J. Blanch  
Dept. of Family & Human Development  
USU  
Logan, UT 84322-2905  
(435) 797-3925

## Appendix L. Mathematics Activity Log

**Math Activity Log**

Date: \_\_\_\_\_

Start Time of Session: \_\_\_\_\_

Subject # \_\_\_\_\_

Finish Time of Session: \_\_\_\_\_

***Please complete one form after each activity session. It is best to complete the form immediately after the session. Remember, the term "math" refers to numbers, quantity, patterns, sequences, shapes, matching, and measurement.***

1. What type of materials did you work with in this session? (i.e. paper, books, blocks)
  
2. Please describe the math activity you did today.
  
3. What math symbols and/or vocabulary did you use in this session?
  
4. Which type of math skills did you practice? (Check all that apply.)
  - Reciting the names of the numbers in order from memory
  - Attaching each number name in order to a series of objects in group
  - Sorting
  - Comparing
  - Identifying and/or reproducing shapes
  - Telling time
  - Recognizing symbols
  - One-to-one corresponding
  - Measuring
  - Sequencing/ Ordering
  - Using money
  - Other \_\_\_\_\_



Appendix M. Psychosocial Activity Log

**Psychosocial Activity Log**

Date: \_\_\_\_\_

Start Time of Session: \_\_\_\_\_

Subject # \_\_\_\_\_

Finish Time of Session: \_\_\_\_\_

*Please complete one form after each activity session. It is best to complete the form immediately after the session. Remember, the term "psychosocial" refers to supporting positive self-esteem; safety and security for young children; choices, rules, and limits; parents as mediators; and parents and children doing things together.*

1. What type of materials did you work with in this session? (i.e. paper, books, blocks)
  
  
  
  
  
  
  
  
  
  
2. Please describe the psychosocial activity you did today.
  
  
  
  
  
  
  
  
  
  
3. What psychosocial terminology did you use in this session?
  
  
  
  
  
  
  
  
  
  
4. Which type of psychosocial development skills did you practice? (Check all that apply.)
  - Supporting positive self-esteem
  - Safety and security for young children
  - Choices, rules, and limits
  - Parents as mediators
  - Parents and children doing things together
  - Other \_\_\_\_\_

Appendix N. Sample Math Newsletter for Pilot



# Math Times



The Parent-Preschooler Connection

June 16, 2000

## Welcome!

On June 14, 2000, parents of local preschoolers met with Monica Blanch, a graduate student from Utah State University in Family and Human Development. Parents learned about their role as math teachers. Parents can be:

- ▶ **coordinators** by staying in contact with preschool teachers,
- ▶ **role models** by doing math activities in front of children, talking positively about math, and showing children why math is important, and
- ▶ **directors** as they play with their children and direct the activity towards math concepts.

Parents will practice these roles in weekly parent-preschooler activities. Parents made math symbol sponges to use for one math activity.

## Great Math Snacks!

Snack time is an ideal time for parents to teach their children math. Sandwiches can be cut into circles, squares, rectangles, and/or triangles by parent or child. Crackers can be bought in a variety of shapes. Bananas, carrots or apples can be cut into fractions to introduce fraction vocabulary. Remember to use all the great math vocabulary (i.e. circle, square, halves) when you have snack time!\*

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## Fun Math Activity: MEASURING!

Measuring for preschoolers means using size comparison words: big (-ger, -est), small (-er, -est), tall (-er, -est), wide (-r, -st) for example. Parents can keep a record of the height and wight on their child on a poster on the wall, so the numbers can be checked any time. These measurements can then be used to compare the child's size to friends, adults, teachers, or siblings. Children can also measure things in the house informally using paper clips, toothpicks, hands, feet, or dental floss.\*

## Parents' Corner

*I send my child to preschool to get educated. Why do I need to take the time to work with him/her?*



Parents are children's most important teachers. Parents create a foundation on which teachers at school can build. Parents can teach children things that are a little hard for them, so when children learn the concept in school, they will be more prepared to learn. Parents will know they are teaching at the right level when their child is enthusiastic, curious, and actively involved.

## Children's Books on Math

*Bourgeois, P., & Clark, B. (1987). Big Sarah's little boots. New York: Scholastic.*  
*Brenner, B. (1966). Mr. Tall and Mr. Small. Menlo Park, CA: Addison-Wesley.*

\*(These ideas were taken from Charlesworth and Lind, 1999).

Appendix O. Sample Assessment Letter to Parents

August 15, 2001

RE: Assessment Results

FIELD(FNAME) FIELD(LNAME)  
 FIELD(ADDR)  
 FIELD(CITY), FIELD(STATE) FIELD(ZIP)

Dear Ms. FIELD(LNAME),

Thank you for your willingness to help further research in child development and parent-child interactions. I have learned so much! This letter is to inform you of the results of the two assessments your 4 or 5 year-old child completed at the beginning and at the end of the study.

First, your child completed six sub-tests of the **Bracken Basic Concept Scale--Revised**. The purpose of this assessment was to measure your child's academic school readiness. These sub-tests addressed some key areas in determining academic school readiness including colors, letters, numbers and counting, sizes, comparisons, and shapes.

<b>Total Score for the Bracken Basic Concept Scale-- Revised</b>		
	<i>Pretest</i>	<i>Post test</i>
<i>Total Raw Score</i>	# / 88	# / 88
<i>Percentile Rank*</i>	#%	#%
<i>Knowledge Level</i>	0	0
<i>Concept Age Equivalent**</i>	0	0

\* This score means that out of 100 children your child's age, your child scored above this percentage of them.

\*\* This score shows the age at which your child's score would be considered an average level of performance.

When broken down by sub-test, the scores of the Bracken assessment were as follows (your child's score/ total score possible):

<b>Sub-test Scores for the Bracken Basic Concept Scale-- Revised</b> (School Readiness Sub-test)		
	<i>Pretest Score</i>	<i>Post test Score</i>

<b>Sub-test Scores for the Bracken Basic Concept Scale-- Revised (School Readiness Sub-test)</b>		
<i>Colors</i>	# / 11	# / 11
<i>Letters</i>	# / 16	# / 16
<i>Numbers/Counting</i>	# / 19	# / 19
<i>Sizes</i>	# / 12	# / 12
<i>Comparisons</i>	# / 10	# / 10
<i>Shapes</i>	# / 20	# / 20

Next, your child completed an **Early Mathematics Concepts** assessment. Eight basic concepts were evaluated through this measure: number terms, counting, combining sets, partitioning sets, comparison, pattern, measurement, and shape and space. This test has been standardized in Great Britain, so all scores reflect your child's scores in comparison with children's scores in Great Britain.

<b>Total Score for the Early Mathematics Concepts Assessment</b>		
	<i>Pretest</i>	<i>Post test</i>
<i>Total Score</i>	# / 67	# / 67
<i>Percentile Rank*</i>		

\* This score means that out of 100 children your child's age, your child scored above this percentage of them.

When broken down by skill, the scores of the Early Mathematics Concepts assessment were as follows (your child's score/ total score possible):

<b>Skill Breakdown Scores: Early Mathematics Concepts Assessment</b>		
	<i>Pretest Score</i>	<i>Post test Score</i>
<i>Number Terms</i>	# / 15	# / 15
<i>Counting</i>	# / 15	# / 15
<i>Combining Sets</i>	# / 1	# / 1

<b>Skill Breakdown Scores: Early Mathematics Concepts Assessment</b>		
	<i>Pretest Score</i>	<i>Post test Score</i>
<i>Partitioning Sets</i>	# / 4	# / 4
<i>Comparison</i>	# / 15	# / 15
<i>Pattern</i>	# / 12	# / 12
<i>Measurement</i>	# / 2	# / 2
<i>Shape and Space</i>	# / 6	# / 6

The individual breakdown of the Early Mathematics Concepts score shows that your child presently has strengths in \* and weaknesses in \*. I encourage you to explore some ways to strengthen your child's weak skill areas. For example, ...

If you have any more questions about these results or would like to see the score sheets for yourself, please contact Monica Blanch at 797-1552. Also, due to cost, if you want the audio tapes from your activity sessions returned to you, please contact Monica by September 15th or the tapes will be destroyed. Thank you again for letting us come into your home and/or bringing your child to the testing site. We really appreciate your willingness to work with us.

Sincerely,

Monica Blanch



## Appendix P. Math Terminology

## Math Terms

*Math is number and number concepts, patterns and relations, shapes and space, and measurement.*

### Lesson 1: Numbers and Number Concepts

One-to-one correspondence: is "The most fundamental component of the concept of number. It is the understanding that one group has the same number of things as another. For example, each child has a cookie, each foot has a shoe, each person wears a hat" (Charlesworth & Lind, 1999, p. 92).

Rote Counting: is "...reciting the names of the numerals in order from memory" (Charlesworth & Lind, 1999, p. 105).

Arranging and rearranging groups: Some groups can be discerned without counting (0 - 4 objects). Therefore, to teach children to arrange and rearrange groups, parents must begin with 0 - 4 item group experiences.

Comparing quantities: is "...finding a relationship between two things or groups of things on the basis of some specific characteristic or attribute" (Charlesworth & Lind, 1999, p. 128), for example, you could say, "I have more cookies than you have." In number, use words like more, less, or fewer in basic comparisons.

Rational Counting: is "...matching each numeral name in order to an object in a group. It builds on children's understanding of one-to-one correspondence" (Charlesworth & Lind, 1999, p. 105).

### Lesson 2: Patterns and Relations

Comparing was discussed in last class. It is defined as "finding a relationship between two things or groups of things on the basis of some specific characteristic or attribute" (Charlesworth & Lind, 1999, p. 128).

"Ordering is a higher level of comparing. Ordering involves comparing more than two things or more than two sets. It also involves placing things in a sequence from first to last" (Charlesworth & Lind, 1999, p. 190). One-to-one correspondence is an early form of ordering, i.e., matching pattern (Charlesworth & Lind, 1999, p. 191). The next step in ordering is placing things in order based on length, width, height, and size of the objects.

Seriation is another term for ordering.

"Patterning involves making or discovering auditory, visual, and motor regularities (Charlesworth & Lind, 1999, p. 190). Example: hand clapping (auditory); colored macaroni necklace (visual); Head, Shoulder, Knees and Toes (motor)

### Lesson 2: Measurement

"Measurement involves assigning a number to things so they can be compared on the same attributes" (Charlesworth & Lind, 1999, p. 204).

### Lesson 3: Shapes

The basic geometric shapes are: circle, triangle, square, rectangle, rhombus, and ellipse (Charlesworth & Lind, 1999, p. 139).

### Lesson 3: Space

Two concepts are related to SPACE.

1. Relationships in space (position, direction, and distance of objects) and
2. Use of space (organization and pattern, and construction)

Appendix Q. Activity Guidelines

### Activity Guidelines

1. Please hold three, ten-minute activity sessions per week with your child.
2. Tape record all of these activity session.
3. To maintain confidentiality, avoid using full names or any identifying information during the sessions.
4. Complete an activity log (see attached) at the end of each activity session.
5. Send the activity logs to Monica Blanch in the provided envelopes when the logs are completed.
6. Make sure to emphasize (math terms and symbols or psychosocial words) during these sessions.
7. Have FUN!

Appendix R. Math Newsletters



# Math Times



Welcome Home! The Parent-Preschooler Connection

January 8, 2001

## Welcome Mothers!

### Keep Smiling!

On January 5, 2001, parents of the Hyrum Chapter of Welcome Home met with Monica Blanch, a graduate student from Utah State University in Family and Human Development. Mothers were reminded that for this project they will be expected to:



- **conduct and tape record** three ten minute math sessions per week with their preschool child,
- **complete one math log** at the end of each session,
- **send in all the math logs each week** to Monica Blanch,
- **return** completed audio tapes to Monica Blanch at the monthly mothers' meetings, and
- **attend all** monthly mothers meetings until April 2001.

If you have any questions regarding any of these expectations or did not receive your materials, please contact Monica Blanch at 797-3925.

Mothers also learned about their **important role** in shaping their children's attitudes about math. Some of the mothers at the meeting suggested helping their children with schoolwork as one way to encourage positive math attitudes. Supporting math activities in the home and encouraging exploration were also mentioned. Even if mothers struggled with math in school, they can help their children by smiling and encouraging their children to succeed in math related activities!

### Dear Gabby

**I** send my child to preschool to get educated. Why do I need to take the time to work with him/her?

Parents are children's most important teachers. Parents create a foundation on which teachers at school can build. Parents can teach children things that are a little hard, so when children learn these concepts in school, they will be more familiar with the concepts and prepared to learn. Parents will know they are teaching at the right level when their child is enthusiastic, curious, and actively involved.



### Soaking it in.. Using your Math Sponges

**H**ere are some great ideas for uses of your math sponges! Try:

1. Timing your child to see how fast he/she can put the numbers in order.
2. Handing the child a numeral and asking them to find that many objects somewhere in the house.
3. Using the sponges as stamps and allowing the child to draw that number of objects beside the numeral.
4. Handing the child a numeral and asking them to find that numeral on licence plates while you drive or take a walk, or
5. Using the sponges to clean. (Ask the child to wipe off the same number objects as the numeral they pull out of the cleaning bucket. This activity might also be fun to clean do in the bathtub as they wash.)

## Bigger or Smaller?

**T**hink of a number between 1 and 10 (or higher if your child knows more numbers). Ask your child to guess the number you are thinking of. Give him/her clues by answering "bigger" or "smaller." When your child is more confident, have him/her choose a number, and you guess! (Taken from the U.S. Department of Education, 2000).

## The Final Countdown



**U**se the timer on the oven or microwave to have your child count down the seconds until dinner is cooked. Children also enjoy counting down to special days like their birthday. Use a calendar to count down the weeks then days until a BIG day. (Taken from the U.S. Department of Education, 2000).

## Math Snacks!

**W**hen you buy your child a bag of candy or raisins, ask him/her to guess how many pieces are in the bag. Dump them onto a paper towel and count to see if there are more than, less than, or the same as the amount your child guessed. If possible, sort the candy by color or shape. Don't forget to count the pieces as he/she eats them. "Keep track of how many a child has eaten and how many are left to eat. 'Here are 5 raisins. When you eat 1, you have 1, 2, 3, 4 left. Eat another 1. So you now ate 2. How many are left?'" (Taken from the U.S. Department of Education, *Early Childhood: Where Learning Begins, Mathematics*, 2000, p. 27.)

## How many?

**M**ath is often associated with answering the question, "How many?" Although counting is only one part of math, children benefit from learning to count up and down. Children need help from parents to count without skipping numbers or counting something twice. Try counting telephone poles, stairs, eggs, windows, chairs, birds. ANYTHING!

## Gleefully Grouping

**H**ousekeeping provides an excellent opportunity for children to experiment with arranging and rearranging groups. Children can sort dishes, laundry, groceries, their toy box, or even that junk drawer you have hidden in the kitchen. Ask them to sort the objects by one attribute and resort by another attribute. Ask them which group has the most items and how many more items are in one group than another group. Ask them how many total objects they have when the groups are combined.

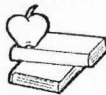
## Number and Number Concept Words

**T**ry using some of these words as you do your activities to help your children become more familiar with math vocabulary: (Taken from Charlesworth & Lutz, 1999.)

<i>how many</i>	<i>count</i>	<i>group</i>
<i>one more than</i>	<i>next number</i>	<i>more</i>
<i>less</i>	<i>big</i>	<i>small</i>
<i>large</i>	<i>little</i>	<i>leftover</i>
<i>few, fewer, fewest</i>	<i>goes with</i>	<i>belong with</i>

## Children's Books on Numbers

- A**ker, Suzanne. *What Comes in 2s, 3s, & 4s?* Simon & Schuster.
- Anno, Mitsumasa. *Anno's Counting Book*, Thomas Y. Crowell.
- Bang, Molly. *Ten, Nine, Eight*. Greenwillow Books.
- Carter, D. A. *How many bugs in a box?* Simon & Schuster.
- Elkin, B. *Six Foolish Fishermen*. Scholastic.
- Frith, M. *I'll Teach My Dog 100 Words*. Random House.
- Pomerantz, C. *One Duck, Another Duck*. Greenwillow.
- Tafari, Nancy. *Who's Counting*. William Morrow & Co.



**\*\*Find more books at your local library!**



# Math Times



Welcome Home: The Parent-Preschooler Connection

February 7, 2001

## Mom Power!

*Your child's best teacher: YOU!*

On February 2, 2001, parents of the Hyrum Chapter of Welcome Home met with Monica Blanch, a graduate student from Utah State University in Family and Human Development. Mothers discussed ways to be good teachers for their children. They can:

1. Take advantage of learning opportunities that happen naturally.
2. Encourage their child to ask questions that require more than a yes or no answer.
3. Encourage their child to think.
4. Ask their child questions to get them thinking.
5. Show respect for their child's thinking and point of view.
6. Repeat activities their child has difficulty doing to reinforce learning, and
7. Move at their child's pace (Friedman & Rock, 1996).

Many children are unprepared for school in the area of math. Mathematics is important in this century. It is part of our lives, our cultural heritage, our careers and our scientific and technical community. "In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their futures. Mathematical competence opens doors to productive futures. A lack of mathematical competence keeps those doors closed" (NCTM, 2000, p.4). Mom's can prepare their children.

## Pattern & Measurement Talk!

Try using some of these words as you do your activities to help your children become more familiar with math vocabulary. (Lace from Charlotte & Janet 1999.)

little	big	medium	tiny	tall	short
thin	wide	cup	pint	quart	inch
hot	cold	thermometer	pound	measure	first
second	third	night	day	minute	hour
old	fast	slow	time	date	soon
many	more	most	thin	thinner	thinnest
next	then	older	younger		

*Dear Gabby*

I'm confused about the section on the math log that says "math terms and symbols used". Are we supposed to use the terms found on the page given the first day of class during our math sessions?



The math terms you are supposed to use in your activity sessions are NOT the terms found on the term sheet from the first day of class. The terms you should use are found in the newsletters. The terms for this month are found in the section, "Pattern and Measurement Talk!" Sorry about the confusion!

## Children's Books on Patterns and Measurement

Allen, P. (1983). Who sank the boat? New York: Coward.



Brett, J. (1987). Goldilocks and the three bears. New York: Dodd, Mead.

Brown, M. W. (1947). Goodnight moon. New York: Harper & Row.

Castle, C. (1985). The hare and the tortoise. New York: Dial.

Greider, I. (1975). Measuring things. New York: Knopf/Pantheon Pinwheel.

Mahy, M. (1987). 17 kings and 42 elephants. New York: Dial.

Perlutsky, J. (1984). It's snowing! It's snowing! New York: Greenwillow.

## Magic Measuring Moments

Learning to measure is a process. Children begin to learn about measuring by playing and imitating you. For instance, they may measure the dirt to go in a delectable mud pie. Next, children learn to make comparisons like my cookie is bigger than your cookie. The children use arbitrary units. For example, they may measure their sandbox by how many hands long each side is. The last step in learning to measure is using standardized units like inches and pounds. Though exposure to these measurement words is good, most children do not begin to use standardized units until they are 6 years-old.



## Great Ideas!

Members of the Welcome Home group suggested some ideas for getting children involved with patterning and measuring. Here's what they suggested:



1. Ask your child to put different sizes of the same shape in order.
2. Label three containers: large, medium, and small. Give your child a pile of objects of different sizes (i.e. dimes, nickels, and quarters) and ask your child to put the items in the appropriate container.
3. At laundry sorting time, ask your child to help you put each family members' clothes in separate piles. Ask your child to tell you who has the biggest pile, who has the next biggest pile, etc.
4. Help your child trace family members' shoes on paper and cut the outlines out. Ask him/her to put the outlines of size.
5. Show your child how to place setting for dinner. Ask your follow your pattern to set everyone else's place setting.
6. Explore patterns in music! Play a simple pattern on the piano (using two or three keys). Ask your child to repeat or continue the pattern that you played. (This activity may also be done with hand clapping, whistling, or singing.)
7. While making beds in the morning, talk about pillow size and blanket size. Ask the child which size is appropriate for their bed, the try that size on their bed.
8. When filling the dishwasher, ask the child to guess how many cups they think that they can put in the top rack of the dishwasher to fill it. Then, have the child fill the dishwasher to see if she/he was correct.
9. Try patterning with: silverware, M&M's, jelly beans, coins,



- Légos, play dough, different types of noodles, and folded socks.
10. Try patterning in snow, a bowl of rice or a cup of flour.
  11. Ask your child how many cups of cereal he/she thinks they eat. Then ask them to measure the cereal in their bowl. (This activity can also be done with how many vegetables will fit in a spoon, how many cups of water it takes to fill a bowl, how many drinks they must take to empty their cup, how many bites to finish their peas, and how many feet long is the bed.)
  12. Cook with your child. Teach them to help you follow a cookie recipe to become more familiar with measuring terms.
  13. Measure how much water sponges hold or water toys hold by transferring the water in them to measuring cups.
  14. Ask your child, "How many hands long is your dresser?"
  15. Make stamp patterns in the snow. (This activity may be done using blocks.)
  16. Make a bead or fruit loop necklace with a pattern.
  17. Sort Legos by lengths. Ask your child to put the Legos in size order.
  18. Measure everyone in the family. Compare the heights, arm lengths, or foot sizes of various family members.
  19. Glue a tongue depressor on an empty thread spool and use as a scale. Place various items on the ends of the tongue depressor to compare weights.
  20. Make up songs to count numbers.
  21. Make snowballs of different sizes and compare them. You may also use different sizes of containers to mold the snow and compare sizes.
  22. Go on a Pattern Scavenger Hunt. Ask your child to find patterns in your house (i.e. pictures or furniture).





# Math Times



Welcome Home: The Parent-Preschooler Connection

March 8, 2001

## Connected!

### Sprint to the End!

On March 2, 2001, parents of the Hyrum Chapter of Welcome Home met for their third meeting. I have been so excited about all the great interactions that parents are having with their children. The feedback about the activities and the classes has been GREAT!

Only one month remains in this research project. Illness, trips, and life's surprises has made completing all the activities difficult. Now is the time to forget the past and step forward to a bright future—resolve this month to finish 12 activities with new enthusiasm!

Our final meeting will be held Friday, April 6th at 1 p.m. in the Hyrum Civic Center. I have some great activities and resources available for this last meeting. Remember to bring all your completed logs and tapes as well as the tape recorders if you borrowed them from me. I hope to see all of you there! *Monica J. Blanch*

### Surprise!

Cut 2 of each shape from old greeting cards. Place one of each shape in a paper sack. Show the child one of the remaining shapes and ask your child to find the shape in the bag and get it out without looking in the bag. This game can be increased in difficulty by putting various sizes of the shapes and asking them to pull out, for example, the small triangle like the one you are holding.



## Shape BINGO

Cut various shapes out of old Christmas cards (to increase difficulty the number of shapes or size of shapes could be varied). Divide a blank sheet of paper into nine boxes to make BINGO cards. Paste the shapes into each box. Make a spinner card out of a circle divided into sections with shapes matching the shapes on the BINGO cards. Give your child a BINGO card. Ask him to spin the pointer and place a dried bean on the matching shape on his/her card and tell you the name of the shape. (This game can be fun for the whole family!) (Taken from *Charlsworth & Lind, 1999*)

## Treasure Hunting

Make a basic treasure map of your house or your yard on a sheet of paper with major landmarks (such as your piano, your couch, or your kitchen table). Draw in some paths going from place to place. Make a decorated treasure chest



from a shoe box and hide it. (Don't forget to hide a treasure inside!) Discuss with your child the best route to get from where they are to the treasure chest using only the paths on the map. Have them try out the path they choose! (Taken from *Charlsworth & Lind, 1999*)



## Egg Cartons, Fabric, & Straws:

*Using Everyday Objects to Learn About Math*



Parents do not need to purchase materials specifically for teaching their children about math.

Creativity and everyday objects are sufficient to teach your child about the beauties of mathematics in preparing them for school. Here are some great ideas members of the Welcome Home group had to use everyday objects to teach their children! Try these great ideas:

1. Play store using empty cereal boxes, milk jugs, or other household items. Your child can play the checker. Use an old egg carton to make a cash register. Making the cash register can be an activity by itself!
2. Make binoculars out of two toilet paper rolls taped together and yarn to hang the binoculars around their neck. Invite your child to go on a shape hunt with you in your house or neighborhood. Can he/she find a circle, square, or triangle on your street?
3. Have a Mini Olympics! Teach children about space and measuring at the same time with events like making a line out of masking tape and seeing how far they can jump or bowling with yogurt cartons and a ball. Children especially love a small prize at the completion of each event!
4. Shoot baskets! After your child has helped you fold the laundry, invite your child to learn more about space by throwing balled up socks into your laundry baskets. Move the basket to different distances and talk about the position of the baskets and of the sock landings.



## Space Words

Try using some of these words as you do your activities to help your children become more familiar with math

vocabulary: (taken from *Characteristics of Math*, 1994, p. 10)

on	off	on top of	over	under	in
up	down	forward	around	through	
near	far	close to	far from	map	

## Children's Books on Shapes & Space

- Budney, B. (1954). *A kiss is round*. New York: Lothrop, Lee, & Shepard.
- Carle, E. (1974). *My very first book of shapes*. New York: Crowell.
- Gordon, M. (1986). *Shapes*. Moristown, NJ: Siver-Burdett.
- Hewavisentti, L. (1991). *Shapes and solids*. Chicago: Franklin Watts.
- Kessler, E., & Kessler, L. (1966). *Are you square?* Garden City, NY: Doubleday.
- Russo, M. (1986). *The line up book*. New York: Greenwillow.



**\*\*Find more books at your local library!**

## Getting into Shapes!

Two very important concepts for preschool aged children in the area of math development are shapes and space. Learning about shapes helps children discern similarities and differences in forms in their environment and helps them describe things in their environment. There are six basic shapes: circle, triangle, square, rectangle, rhombus (diamond) and ellipse (oval).

Learning about space also helps children learn more about their environment. There are relationships in space, such as position, direction and distance of objects. There is also uses of space, such as organization and pattern and construction; these uses can be seen when clothes fit in a drawer folded but not unfolded.



# Math Times



Welcome Home: The Parent-Preschooler Connection

April 9, 2001

## Thank You!

You are GREAT!

On April 6, 2001, parents of the Hyrum Chapter of Welcome Home met with Monica Blanch, a graduate student from Utah State University in Family and Human Development for their final meeting. Mothers were informed that:

- ▶ *all* math logs and audio tapes are due at this time,
- ▶ parents also need to *complete two forms*: a final attitudes measure and an evaluation of the program,
- ▶ *final testing* of the children will take place this month (parents will be contacted within the next two weeks about arranging appointment times), and
- ▶ parents will *receive the results* of the testing and completed audio tapes returned within two weeks of when the testing is completed.

If you have any questions regarding any of this information or did not receive your materials, please contact Monica Blanch at 797-3925. Within the next two weeks, she will be contacting all mothers who did not attend the final meeting and who do not call her before the two weeks.

## Final Farewell

I planned to give all the participants something special as a thank you for your willingness to participate in my thesis

research program, Welcome Home. Nothing I could buy on my college student budget could ever express my gratitude well enough. I have enjoyed working with all of you. I have learned so much. With all my heart, THANK YOU! —Monica



## The Journey Continues...



Many mothers at the April meeting expressed how much they have

enjoyed doing activities with their children and how much their children have enjoyed doing activities with them. You have learned through this class to be more effective teachers of your children. You have participated in a variety of activities with your child. What are you going to do with your knowledge?

The goal is that you continue to look for opportunities to teach your children in everyday life. These experiences can come as children question, as you point out specific behaviors they are already doing, or as you sit down with your child in structured activity. Here are some resources where you can learn more about your child's development and more activities you can do with your child to prepare them for school and beyond. Check out:

1. *Math and Science for Young Children (3rd ed.)*, by Rosalind Charlesworth and Karen K. Lind.
2. The U.S. Department of Education at 1-877-4ED-Pubs or visit their web site at [www.ed.gov/pubs/edpubs.html](http://www.ed.gov/pubs/edpubs.html) to get a catalogue of free publications available. They have books about early childhood math, geography and reading.
3. The Dollar Store for workbooks. More expensive workbooks can be covered in contact paper and written in with dry erase markers to increase longevity.
4. The Love to Learn web site at [www.lovetolearn.com](http://www.lovetolearn.com).
5. Your local library or bookstore.
6. *The Parents' Resource Almanac* by Beth DeFrancis.
7. [www.gryphonhouse.com](http://www.gryphonhouse.com) (purchasable items)
8. The Hall of Early Childhood at <http://www.tenct.edu/academia/earlychild.html#ear:enl>
9. The Perpetual Preschool at <http://www.perpetualpreschool.com/>
10. Search the web with keywords about parent resources for early childhood education.

Appendix S. Math Class Lesson Plans



<p><b>Lesson Part I:</b> Parents as Math Teachers Training 15 minutes</p>	<p><u>Supporting a Positive Math Attitude</u></p> <ul style="list-style-type: none"> <li>• Ask parents to complete "A Mathematics Attitude Test" by Mona Fabricant. Show them how to score the "test."</li> <li>• Share personal experience about how my parents felt about math.</li> <li>• Ask: <b>What experiences do you think led to your feelings about math? How do you think your attitude about math affects your child?</b> (List their ideas on a piece of butcher paper.)</li> <li>• Math Attitudes Matter:       <ul style="list-style-type: none"> <li>* Discuss findings of Young-Loveridge (1989)           <ul style="list-style-type: none"> <li>- <i>Six subjects participated in this case study, namely: two high math achieving children, as found from the Number Tasks Interview, from high SES families; two high math achieving children from low SES homes; and two low math achieving children from high SES homes. Mothers were interviewed to find out about the children's home experiences and about the attitudes of both mother and father about mathematics.</i></li> <li><i>The results of this study suggested the important role of parents' attitudes. Parents who had a strong numeracy orientation had children who were high math achieving. Mothers' expectations for their children in math were related to their own attitudes about math and their own mathematical ability Number Tasks Interview. Young-Loveridge (1989) also found that, although none of the mothers enjoyed math in school, mothers of high math achieving children were more supportive of fostering math activities in the home.</i></li> </ul> </li> <li>* Discuss findings of Leder (1992)           <ul style="list-style-type: none"> <li>- <i>In an observational study of two four-year-olds in the same preschool class— one bright and one average as identified by the Peabody Picture Vocabulary Test, the Franston Hospital Concept Test, and the Keymath Test, Leder (1992) found these children came from different environments. The high math achiever's mother encouraged independence while the low math achieving child's mother encouraged a more passive role. These roles parents developed for their children were reflective of their attitudes.</i></li> </ul> </li> </ul> </li> <li>• Ask: <b>What are some ways to support a positive math attitude?</b> (List their ideas on a piece of butcher paper.) Suggestion by Mona Fabricant (1985): "Look back at the test questions and write down the situations in which you scored a one. When you find yourself in that situation or one similar to it make a conscious effort to eliminate any negative comments about mathematics" (p. 33).</li> </ul>	<p>"A Mathematics Attitude Test" by Mona Fabricant.</p> <p>butcher paper, marker</p>
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<p><b>Lesson Part II:</b> Concepts Parents Can Teach Training 15 minutes</p>	<p><u>Numbers and Number Concepts</u></p> <ul style="list-style-type: none"> <li>• What is math? <ul style="list-style-type: none"> <li>* Discuss math categories that will be covered over the next three months: numbers and number concepts, patterns and relations, shapes and space, and measurement.</li> </ul> </li> <li>• Goal is to connect counting with quantity through: <ul style="list-style-type: none"> <li>* One-to-one correspondence,</li> <li>* Arranging and rearranging groups,</li> <li>* Comparing quantities, and</li> <li>* Counting (rote and rational) (Charlesworth &amp; Lind, 1999, see p. 103-115).</li> </ul> </li> <li>• Define each of these four concepts with examples (see Charlesworth &amp; Lind). <u>One-to-one correspondence</u>: is "the most fundamental component of the concept of number. It is the understanding that one group has the same number of things as another. For example, each child has a cookie, each foot has a shoe, each person wears a hat" (p. 92). Example: enough pennies to buy a handful of penny candy; setting the table</li> </ul> <p><u>Rote Counting</u>: is "...reciting the names of the numerals in order from memory" (Charlesworth &amp; Lind, 1999, p. 105). Example: Use a rhyme to learn rote counting like <i>One, 2 Buckle Your Shoe</i> (p. 108).</p> <p><u>Arranging and rearranging groups</u>: Some groups can be discerned without counting (0-4 objects). Therefore, to teach children to arrange and rearrange groups, parents must begin with 0-4 item group experiences. (See page 110 for Using sets of 0-4 activity.)</p> <p><u>Comparing quantities</u>: is "finding a relationship between two things or groups of things on the basis of some specific characteristic or attribute" (p. 128). Example: I have more cookies than you have. In number you use words like more, less/fewer in basic comparisons. Activity: Comparing, Number, page 131</p> <p><u>Rational Counting</u>: is "...matching each numeral name in order to an object in a group. It builds on children's understanding of one-to-one correspondence" (Charlesworth &amp; Lind, 1999, p. 105). Rational counting (4 or 5 yr-old) develops later than rote counting (2 or 3 yr-old). Example: Rational counting: Groups larger than 5; p. 111)</p>	<p>flannel board and/or magnetic board, groups of 6 of objects, pictures of 2 and 6 of objects</p> <p>two dolls and 10 cookies (real or fake)</p>
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<p><b>Activity:</b> Developing Math Activities 15-20 minutes</p>	<p><u>Number Symbol Sponges</u></p> <ul style="list-style-type: none"> <li>• Give each parent ten sponges. Ask them to make number symbols out of the sponges. These sponges can be used:           <ul style="list-style-type: none"> <li>* at bath time, when children take a bath have them repeat the name of the symbol as they drop each sponge into the tub,</li> <li>* at game time, hide the number in a room and have the child find them; discover whether all the numbers are there by placing them in order and counting them with your child, or</li> <li>* at play time, give the child blank paper and paints to dip the sponges in and have them create a picture; ask them to point out and name which numbers they used in their picture.</li> </ul> </li> </ul> <p><u>More Possible Activities for the Triweekly Activity Sessions</u> <i>This activity can be done while parents are working on their sponge number symbols.</i></p> <ul style="list-style-type: none"> <li>• Parents will be broken into small groups and asked to think of some activities they could do with their children related to this topic. <u>Math and Science for Young Children</u> by Charlesworth and Lind and <u>Early childhood: Where Learning Begins, Mathematics</u> and <u>Helping Your Child Learn Math</u> by the Department of Education will be available as reference books. One member of the group will record the suggestions on butcher paper. The group will reconvene after 10 minutes and share their ideas with the class. Parents can make notes of these activities. These activity suggestions will be printed in the newsletter that will be published the next week.</li> </ul>	<p>ten sponges for each parent, scissors, markers</p> <p>butcher paper, markers</p> <p><u>Math and Science for Young Children</u> by Charlesworth &amp; Lind ; <u>Early childhood: Where Learning Begins, Mathematics ; Helping Your Child Learn Math</u> by the Dept of Education</p>
<p><b>Conclusion:</b> Do you have any questions? 5 minutes</p>	<p><u>Dear Gabby</u></p> <ul style="list-style-type: none"> <li>• Distribute slips of paper to the class. Ask them to write any suggestions or questions that they have. These will be printed in the monthly newsletter. If their questions are expedient, invite them to stay after class and ask the questions to you individually. Thank them for coming and remind them of the next scheduled class time.</li> </ul>	<p>Blank pieces of paper, and pens or pencils</p>

**Processing Questions:**

- What is expected of you as a participant in this class?
- What is the role of parental attitude in a child's development?
- What are one-to-one correspondence, arranging and rearranging groups, comparing quantities, and counting (rote and rational)?
- What are some activities you can do with your child to help them develop number and number concepts?

**Lesson 2**

**Objective:** *To help parents know more about their role as math instructors. To help parents learn what patterns, ordering, and measurement mean in their child's developmental scheme and activities they can do with their child to enhance this development.*

**Discussion Outline****Materials  
Needed**

<b>Introduction:</b> Question/ Answer/Share 5- 10minutes	<u>Sharing Time</u> <ul style="list-style-type: none"> <li>• Explain to the parents that you will be throwing a ball around the room. Whoever catches the ball will share one of the most fun activities that they did since the last meeting. Then, that person will throw the ball to someone else in the class.</li> </ul>	Ball
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<p>Lesson Part I: Parents as Math Teachers Training 15 minutes</p>	<p><u>The Role of Parents as Formal Math Instructors</u></p> <ul style="list-style-type: none"> <li>• Ublick– Children are like ublick. The more that you work with them the stronger they become, but, when they are left alone, they become weaker. Children need their parents.</li> <li>• How to be a Good Teacher for Your Child (Fromboluti &amp; Rinck, 1999)</li> </ul> <p>1. Take advantage learning opportunities that happen naturally. (To be good teachers, parents do not need to write out lesson plans necessarily. Parents do need to take advantage of everyday situations to teach children to learn. For example, by helping sort the laundry, children learn to classify and sort.) 2. Encourage your child to ask questions that require more than a yes or no. 3. Encourage your child to think. 4. Ask your child questions to get them thinking. 5. Show respect for your child's thinking and point of view. 6. Repetition is good. (By doing the same activities over and over, children understand better and better.)</p> <p>7. Move at your child's pace.</p> <p><u>What's the Use of Math: Who Really Cares or Uses This Stuff</u></p> <ul style="list-style-type: none"> <li>• The National Council on Mathematics issues this vision: "The need to understand and be able to use mathematics in everyday life and in the workplace has never been greater and will continue to increase. For example: <u>Mathematics for life</u>. Knowing mathematics can be personally satisfying and empowering. The underpinnings of everyday life are increasingly mathematical and technological. For instance, making purchasing decisions, choosing insurance or health plans, and voting knowledgeably all call for quantitative sophistication. <u>Mathematics as a part of cultural heritage</u>. Mathematics is one of the greatest cultural and intellectual achievements of human-kind, and citizens should develop an appreciation and understanding of that achievement, including its aesthetic and even recreational aspects. <u>Mathematics for the workplace</u>. Just as the level of mathematics needed for intelligent citizenship has increased dramatically, so too has the level of mathematical thinking and problem solving needed in the workplace, in professional areas ranging from health care to graphic design. <u>Mathematics for the scientific and technical community</u>. Although all careers require a foundation of mathematical knowledge, some are mathematics intensive. More students must pursue an educational path that will prepare them for lifelong work as mathematicians, statisticians, engineers, and scientists. In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their futures. <i>In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their futures. Mathematical competence opens doors to productive futures. A lack of mathematical competence keeps those doors closed.</i>" (NCTM, p. 4)</li> <li>• Ask: Who uses math? Why is math important? What doors can it open?</li> </ul>	<p>Ublick</p>
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<p><b>Lesson Part II:</b></p> <p>Concepts Parents Can Teach Training 15 minutes</p>	<p><u>Patterns and Relations</u></p> <ul style="list-style-type: none"> <li>Comparing, ordering, and seriation underlie the concept of patterning.</li> <li>Defining terms: Comparing was discussed in last class. It is defined as "finding a relationship between two things or groups of things on the basis of some specific characteristic or attribute" (Charlesworth &amp; Lind, 1999, p. 128). "<u>Ordering</u> is a higher level of comparing. Ordering involves comparing more than two things or more than two sets. It also involves placing things in a sequence from first to last" (Charlesworth &amp; Lind, 1999, p. 190). One to one correspondence is an early form of ordering, i.e. matching pattern (p. 191). The next step in ordering is placing things in order based on length, width, height, and size of the objects. Show activity 5G on page 195. <u>Seriation</u> is another term for ordering. "<u>Patterning</u> involves making or discovering auditory, visual, and motor regularities" (Charlesworth &amp; Lind, 1999, p. 190). Example: hand clapping (auditory), colored macaroni necklace (visual), Head, Shoulders, Knees and Toes (motor)</li> <li>Ordering and Patterning words: next, last, before, after, biggest, smallest, fattest, thinnest, tallest, shortest, first, second, third, and fourth.</li> </ul> <p><u>Measurement</u></p> <ul style="list-style-type: none"> <li>"<u>Measurement</u> involves assigning a number to things so they can be compared on the same attributes" (Charlesworth et al., 1999, p. 204).</li> <li>Measurement process:             <ol style="list-style-type: none"> <li>Plays and imitates (pretends to measure like older children and adults— mud pie)</li> <li>Makes comparisons (bigger, smaller, etc.)</li> <li>Uses arbitrary units (i.e., toothpicks, feet, hand length) * Using standard units doesn't begin until 6+.</li> </ol> </li> <li>Use measurement words to help children become more familiar to the terms (i.e. high fever, cooking measuring cups).</li> <li>Types of Measurement             <ol style="list-style-type: none"> <li>Volume (size of container for left overs)</li> <li>Weight (teeter-totter— put objects in order; p. 210)</li> <li>Length (ruler, string, height chart)</li> <li>Temperature (cut out pictures in a magazine of hot and cold objects)</li> <li>Time (toughest concept— model and use time words; calendar count down days)</li> </ol> </li> </ul>	<p>5 ordering objects</p> <p>color macaroni necklace map of measurement process</p> <p>teeter-totter scale; height chart; magazine hot/cold objects calendar example</p>
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<p><b>Activity:</b></p> <p>Developing Math Activities</p> <p>15-20 minutes</p>	<p><u>Using Children's Books</u></p> <ul style="list-style-type: none"> <li>* Using the children's book, <u>Goldilocks and the Three Bears</u> show the parents how to use books to emphasize ordering and patterning (p. 199). Have parents role play story reading interactions.</li> <li>* Parents can also use other children's books that relate to helping children understand mathematics. They can ask their local librarian for examples and look in the monthly newsletter for more suggestions.</li> </ul> <p><u>Graduated Cylinders</u></p> <ul style="list-style-type: none"> <li>* Use paper towel or toilet paper rolls to make cylinders of various sizes to make patterns and to practice ordering objects and to measure items in a household. Parents can decorate these cylinders with their children and compare them as one of their activities this week.</li> </ul> <p><u>Activity Ideas</u></p> <ul style="list-style-type: none"> <li>* Invite each class member to write down three activities they can do this week which are patterning and ordering activities. If they get stumped invite them to talk amongst themselves to find more ideas.</li> </ul> <p><u>Math and Science for Young Children</u> by Charlesworth and Lind and <u>Early childhood: Where Learning Begins, Mathematics, and Helping Your Child Learn Math</u> by the Department of Education will be available as reference books. These ideas will be returned to the teacher and printed in the monthly newsletter.</p>	<p><u>Goldilocks and the Three Bears</u></p> <p>Paper towel rolls or toilet paper rolls for all the members of the class</p> <p>paper and pens or pencils for all members of the class</p> <p><u>Math and Science for Young Children</u> by Charlesworth &amp; Lind; <u>Early childhood: Where Learning Begins, Mathematics ; Helping Your Child Learn Math</u> by the Dept of Education</p>
<p><b>Conclusion:</b></p> <p>Do you have any questions?</p> <p>5 minutes</p>	<p><u>Dear Gabby</u></p> <ul style="list-style-type: none"> <li>* Distribute slips of paper to the class. Ask them to write any suggestions or questions that they have. These will be printed in the monthly newsletter. If their questions are expedient, invite them to stay after class and ask the questions to you individually. Thank them for coming and remind them of the next scheduled class time.</li> </ul>	<p>Blank pieces of paper, and pens or pencils</p>

**Processing Questions:**

- What is the role of parents in teaching young children?
- How is math useful in all walks of life and throughout a lifetime?
- What concepts underlie patterning?
- What is the process of understanding of measurement in children?
- How you use children's books to teach math?

## Lesson 3

**Objective:** To help parents understand how to incorporate thinking and content math into their triweekly activities. To help parents understand and develop activities about shapes and space for their 4 or 5 year-old.

## Discussion Outline

## Materials Needed

	Discussion Outline	Materials Needed
<p><b>Introduction:</b> Question/ Answer/Share 5-10minutes</p>	<p><u>Sharing Time:</u> Hot Potato</p> <ul style="list-style-type: none"> <li>• Ask the parents to sit in a circle around the room. Pass a ball around the circle while music plays in the background. When the music stops, the person holding the ball will describe one fun math activity they have done with their child in the last month.</li> </ul>	<p>Ball; music tapes or CDs; tape recorder or CD player</p>
<p><b>Lesson Part I:</b> Parents as Math Teachers Training 15 minutes</p>	<p><u>Thinking Math versus Content Math</u></p> <ul style="list-style-type: none"> <li>• <u>Thinking Math:</u> (AKA Informal Math)             <ol style="list-style-type: none"> <li>1. Problem solving-- thinking through a problem and solving it logically</li> <li>2. Communication -- talking (verbal or pictorially or symbolically) and listening with children</li> <li>3. Reasoning-- Think through a problem and come up with a solution</li> <li>4. Connections-- Relating math to everyday life</li> </ol> </li> <li>• <u>Content Math:</u> (AKA Formal Math)             <ol style="list-style-type: none"> <li>1. Estimation--</li> <li>2. Number sense--</li> <li>3. Geometry and spatial sense--</li> <li>4. Measurement--</li> <li>5. Statistics and probability--</li> <li>6. Fractions and decimals--</li> <li>7. Patterns and relationships--</li> </ol> </li> <li>• <u>Content math is built on thinking math.</u> The relationship between content and thinking math is a cycle. As children gain thinking knowledge they build foundations for content math knowledge. As content math knowledge increases, children are prepared for more advanced thinking math (Ginsburg, Klein, &amp; Starkey, 1997).</li> <li>• Ask: <b>What is thinking math? What is content math?</b> Make sure they understand.</li> </ul>	<p>Draw the Thinking Math-Content math cycle on a piece of butcher paper</p>



<p><b>Activity:</b></p> <p>Developing Math Activities</p> <p>15-20 minutes</p>	<p><u>Empty Cans (cookie cutters, templates, fill and empty):</u></p> <ul style="list-style-type: none"> <li>• How can these cans help your children learn more about shape and space? (List ideas on a piece of butcher paper.)</li> <li>• Decorate the cans</li> </ul> <p><u>More Possible Activities for the Triweekly Activity Sessions</u></p> <p><i>This activity can be done while parents are working on their cans.</i></p> <ul style="list-style-type: none"> <li>• Parents will be split into groups and given a list of household items that could be used as in their math activities. Invite parents to think of some activities they could do with their children related these common objects and to shapes and space or the other math categories we have discussed in previous lessons. <u>Math and Science for Young Children</u> by Charlesworth and Lind and <u>Early childhood: Where Learning Begins, Mathematics, and Helping Your Child Learn Math</u> by the Department of Education will be available as reference books. One member of the group will record the suggestions on the list beneath each item. The group will reconvene after 10 minutes and share their ideas with the class. Parents can make notes of these activities. These activity suggestions will be printed in the newsletter which will be published the next week.</li> </ul>	<p>Butcher paper; markers</p> <p>paint, paper, glue, scissors, markers, glitter</p> <p>list of household items (p. 510) typed with space to write beneath each item; pens</p> <p><u>Math and Science for Young Children</u> by Charlesworth &amp; Lind; <u>Early childhood: Where Learning Begins, Mathematics ; Helping Your Child Learn Math</u> by the Dept of Education</p>
<p><b>Conclusion:</b></p> <p>Do you have any questions?</p> <p>5 minutes</p>	<p><u>Dear Gabby</u></p> <ul style="list-style-type: none"> <li>• Distribute slips of paper to the class. Ask them to write any suggestions or questions that they have. These will be printed in the monthly newsletter. If their questions are expedient, invite them to stay after class and ask the questions to you individually. Thank them for coming and remind them of the next scheduled class time.</li> </ul>	<p>Blank pieces of paper, and pens or pencils</p>

**Processing Questions:**

- What is the difference between thinking and content math?
- What are the basic geometric shapes and why is it important to know about them?
- What concepts are related to space?
- What are some mathematical activities for young children with everyday household items?



## Lesson 4

**Objective:** To encourage parents to continue teaching children after the class no longer meets.

*Discussion Outline**Materials Needed*

<p><b>Introduction:</b> Question/Answer/ Share 5-10minutes</p>	<p><u>Sharing Time</u></p> <ul style="list-style-type: none"> <li>My Favorite Part Musical Chairs: Invite the parents to arrange their chairs into a circle. Remove one chair from the circle. Turn on some music and have the parents walk around in the circle until the music stops, then they must sit down. Whomever is standing shares with the class their favorite part about participating in this program.</li> </ul>	<p>Tape player and music tape</p>
<p><b>Lesson Part I:</b> Parents as Math Teachers Training 15 minutes</p>	<p><u>Teaching Resources: Keep Teaching Though Class is Over</u></p> <p>So, you want to know more about your child's math development? Try these sources:</p> <ul style="list-style-type: none"> <li>Department of Education— <a href="http://www.ed.gov/pubs/parents/">http://www.ed.gov/pubs/parents/</a> or 1-877-4-ED-PUBS.</li> <li>Charlesworth, R., &amp; Lind, K. (1999). <u>Math and science for young children</u> (3<sup>rd</sup> ed.). Albany, NY: Delmar.</li> <li>About Kids and Math <a href="http://kidsmath.about.com/kids/kidsmath/cs/mathdailyuses/index.htm?iam=spkask&amp;terms=Who+uses+math%3F">http://kidsmath.about.com/kids/kidsmath/cs/mathdailyuses/index.htm?iam=spkask&amp;terms=Who+uses+math%3F</a></li> <li><b>Do you have any other ideas about where parents can go to learn about activities they can do with their children to promote optimal development?</b></li> </ul>	
<p><b>Lesson Part II:</b> Concepts Parents Can Teach Training 15 minutes</p>	<p><u>Math in Everyday Life</u> Through this class you have learned to be a more effective teacher for your child. You have learned the basic components of math development. You have participated in a variety of activities with your child. What are you going to do with your knowledge? Keep looking for opportunities to teach your child in everyday life. These experiences can come as children as questions, as you point out specific behaviors they are already doing, or as you sit down with your child in structured activity.</p> <ul style="list-style-type: none"> <li><b>What benefits have you received from participating in this class? What benefits has your child received by participating in this class?</b></li> <li>Thank you for participating. This has been so much fun.</li> </ul>	

<b>Activity:</b> Developing Math Activities 15-20 minutes	<u>Info Exchange</u> Invite the parents to visit and exchange phone numbers so that they will continue to have a network in which to share their ideas and ask questions to others that understand.	Name and Phone lists
<b>Conclusion:</b> Questions 5 minutes	<u>Sincerely, Gabby</u> <ul style="list-style-type: none"> <li>• Teacher and program evaluation. What have you learned? What do you wish would have been better?</li> </ul>	Evaluation Sheet

**Processing Questions:**

- Where can you go to get more information and ideas about teaching your children as they grow older?
- How does math fit in everyday life?

## Appendix T. Psychosocial Terminology

## **Psychosocial Terms**

*The term "psychosocial" development refers to the attitudes and skills that help children become active, contributing members of society. Society's demands at each stage in life contribute to children's unique personalities and their psychosocial development, according to Erikson (Berk, 1998).*

### **Lesson 1: Supporting Positive Self-Esteem**

**Self-esteem:** "An aspect of self-concept that involves judgements about one's own worth and the feelings associated with those judgments" (Berk, 1998, p. G-12).

**Self-concept:** "The sum total of attributes, abilities, attitudes, and values that an individual believes defines who he or she is" (Berk, 1998, p. G-12).

### **Lesson 1: Safety and Security**

**Protection** is "supervision or support of one that is smaller and weaker" (Merriam-Webster's Collegiate Dictionary, 2001, [on-line]).

**Confidence** is "a feeling or consciousness of one's powers or of reliance on one's circumstances" (Merriam-Webster's Collegiate Dictionary, 2001, [on-line]).

### **Lesson 2: Choices, Rules, and Limits**

**Making choices:** Children need to make some choices on their own. Children need to know that you respect what they need and want. They feel more confident and better about themselves when you respect what they like.

**Preference choices** are choices which are neither wrong nor right like your child's favorite color.

**Thinking choices** are choices which children need information about to get good or bad results like touching a hot stove.

**Limits** "keep [children] safe, keep others safe, help children learn the expectations of others and be liked by them, and make daily life easier" (Home Visitor Guide, p. 31).

**Appropriate behaviors** are behaviors which are not always right or wrong; these behaviors are right or wrong depending on the situation.

### **Lesson 3: Parents as Mediators**

**Mediator:** Children are indiscriminate learners. Therefore, they need people who have their best interests in mind to select, refine, explain or deflect messages. Parents mediate the messages children receive because parents are children's first mediators. Mediating requires constant monitoring what children watch and hear as well as who their children spend time with.

### **Lesson 3: Parents and Children Doing Things Together**

**Child-centered activities** help children know you are interested in their activities.

**Parent-centered activities** help children learn about their role and value in the family to prepare them for when they get older.

Appendix U. Psychosocial Development Newsletter



# Social Times



Welcome Home: The Parent-Pre-schooler Connection

March 20, 2001

## Welcome Mothers!

### Keep Smiling!



On March 7, 2001, parents of the Weston Chapter of Welcome Home met with Monica Blanch, a graduate student from Utah State University in Family and Human Development. Mothers were reminded that for this project they will be expected to:

- ▶ **conduct and tape record** three ten minute psychosocial sessions per week with their preschool child,
- ▶ **complete** one psychosocial log at the end of each session,
- ▶ **send in all** psychosocial logs each week to Monica Blanch,
- ▶ **return** completed audio tapes to Monica Blanch at the monthly mothers' meetings or make-up meetings, and
- ▶ **attend all monthly** mothers meetings or set up make-up meetings until June 2001.

If you have any questions regarding any of these expectations or did not receive your materials, please contact Monica Blanch at 797-3925.

Mothers also learned about their *important role* in shaping their children's attitudes about themselves. Some of the mothers at the meeting suggested doing their child's favorite activity with them as one way to encourage positive self-esteem. Avoiding comparing your preschool child with one of their siblings and encouraging exploration were also mentioned. Even if mothers struggle with their own self-esteem, they can help their children by smiling and encouraging their children to succeed in new activities!

### Story TIME! *\*\*Find more books at your local library!*

Berenstein, Stan & Jan (1985). The Berenstain Bears Learn about Strangers.

Glaser, Nily (1994). Be Street Smart - Be Safe:

Raising Safety Minded Children.

Grimm, Carol (1994). ABCs of Personal Safety for Preschool Age Children.

Lucado, Max (1997). You are Special.

Neimark, Jill & Weiner, Marcella B. (1994). I Want Your Mom: A Story for Children About Self-Esteem.

Rathmann, Peggy (1995). Officer Buckle and Gloria.

### Dear Gabby

*I send my child to preschool to get educated. Why do I need to take the time to work with him/her?*

Parents are children's most important teachers. Parents create a foundation on which teachers at school can build. Parents can teach children things that are a little hard, so when children learn these concepts in school, they will be more familiar with the concepts and prepared to learn. Parents will know they are teaching at the right level when their child is enthusiastic, curious, and actively involved.



### Soaking it in.. Using Sponges

Here are some great ideas for uses of your sponges! Try:

1. Making sponge people (You could play the child sponge, and your child could play the parent sponge. This activity would help you know more about how they think you view them),
2. Using the sponges as stamps and allowing the child to create pictures of things that could be dangerous for them and how to protect themselves or to create pictures that show their favorite things about themselves, or
3. Using the sponges to clean. Show your child how to clean, then compliment them on the good job they do. (This activity might also be fun to do in the bathtub as they wash.)

### Good-night! Bed Time Rituals



One way to build your child's confidence is to develop a bed-time ritual.

As the parent tucks the child into bed each night, he/she can tell the child

something the child did that day that made the parent happy. The child, in turn, can share something with the parent that made him/her proud.

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## Stranger Danger!

Parents in the Welcome Home group were nervous about making their children too afraid of strangers when they taught them about "stranger danger." Here are some possible suggestions from experts:

1. "Charlie Check-First says: "Check First before you go anywhere with anyone!"

This is a truly effective way for children to make wise decisions. No longer do they have to judge how well they think they know a person. Before children go anywhere with anyone, they should check first with the adult who is in charge of them at the time. If there is no way to check with an adult, then the answer is NO.

Check First before getting in a car with someone, before going in a neighbor's house, before taking money for unloading a truck etc." (Safety Kids, Inc, 2001, available:

<http://nksad.wiu.k12.pa.us/safety/skmission.htm>)

2. In response to a mother's question about teaching her three year-old daughter about strangers but not frightening her, Jan Faull says, "Your daughter is confused because the concept of "strangers" is too difficult for her to grasp. Who exactly is a stranger? Are the parents of her preschool friends strangers? Are people you chat with in the grocery line strangers?"

She knows the difference between family and others, but she isn't discriminating enough to know the difference between strangers who are threatening and those you can be nice to, but not overly nice."

There are two things that Jan Faull suggests parents do to teach children about stranger danger while not frightening them. First, she suggests that parents set an example: "... simply demonstrate an appropriate level of friendliness to people you don't know, and explain your protocol for talking with various people. Don't expect her to understand all the subtleties until she's much older, however. For now it's much more important for her to grasp the idea that she should stay right by your side in public places."

As children get older, Jan Faull suggests giving children more information about serious threats from strangers who might hurt them and what to do. She adds, "... it's a parent's job to keep a watchful eye out without paralyzing them or giving them the idea that the world is full of dangerous people. Most people love and protect children and will help them in time of need. Your daughter needs to hear this message, as well as one about managing herself safely in public places when she's older and away from your protective gaze." (Jan Faull, 2001, available: [http://family.go.com/Features/family\\_0307\\_02/dony/dony771stranger/dony771stranger.html](http://family.go.com/Features/family_0307_02/dony/dony771stranger/dony771stranger.html))

## DAISY: Using Code Words

Develop a family "code word." Make sure that everyone can remember this special word and that the word is not used in everyday life. The code word should be a signal for the family to get together IMMEDIATELY!

Talk about times when the code word could be used. For example, if the code word were DAISY, when mom yelled, "DAISY," all the family members would stop what they were doing and find mom. The code word code also be used to protect children from strangers by gathering them together or telling them to go with a stranger only when the stranger knows the family code word. Practice using the code word. (Taken from the U.S. Department of Education, 1993.)



## Making Home Safe

Talk with your child about making your home safe. Show the child some of the safety features you have in your home and tell them how these features protect them. If your home needs additional safety features, have the child help to install them. Some home safety tips for a preschool child are:

- make sure all water stores like buckets of water, swimming pools, and toilets are inaccessible,
- put all poisons (like cleaning supplies and medications) in a locked, inaccessible location,
- keep all matches and lighters out of the child's reach
- keep all electrical cords, appliances, and outlets out of reach and cover all outlets where possible,
- install safety latch on oven to prevent dangerous burns, and
- keep all plastic wrap and plastic gabs away from the child.

## Safety, Protection and Self-Esteem Words

Try using some of these words as you do your activities to help your children become more familiar with psychosocial vocabulary (Be sincere!):



<i>great</i>	<i>special</i>	<i>important</i>	<i>smart</i>	<i>creative</i>
<i>strong</i>	<i>unique</i>	<i>beautiful</i>	<i>helpful</i>	<i>brave</i>
<i>good job</i>	<i>thank you</i>	<i>protect safe</i>	<i>proud</i>	<i>happy</i>
		<i>danger</i>	<i>care</i>	<i>love</i>



# Social Times



Welcome Home: The Parent-Preschooler Connection

April 9, 2001

## Mom Power!

*Your child's best teacher: YOU!*

On April 4, 2001, parents of the Weston Chapter of Welcome Home met with Monica Blanch, a graduate student from Utah State University in Family and Human Development. Mothers discussed ways to be good teachers for their children. They can:

1. Take advantage of learning opportunities that happen naturally.
2. Encourage their child to ask questions that require more than a yes or no answer.
3. Encourage their child to think.
4. Ask their child questions to get them thinking.
5. Show respect for their child's thinking and point of view.
6. Repeat activities their child has difficulty doing to reinforce learning, and
7. Move at their child's pace. (From Nelson & Smith, 1999)

Many children are unprepared for school in the area of social and emotional skills. Psychosocial development is important in this century. It is part of our lives, our cultural heritage, our careers and our scientific and technical community. Mom's can prepare their children.

### Let's Talk!

Try using some of these words as you do your activities to help your children become more familiar with psychosocial vocabulary:

rules limits choice good thinking

What do you think... consequence accountable

Why do you think... consistent boss

"in charge" judgement In this situation...

acceptable behavior (time and place) fair

*Dear Gabby*



I'm confused about the section on the psychosocial log that says "psychosocial terms and symbols used". Are we supposed to use the terms found on the page given the first day of class during our psychosocial sessions?

The psychosocial terms you are supposed to use in your activity sessions are NOT the terms found on the term sheet from the first day of class. The terms you should use are found in the newsletters. The terms for this month are found in the section, "Let's Talk!" Sorry about the confusion!

*Story TIME!*

- Markers, J., & Smith, M. (2001). Good Thing You're Not an Octopus!  
 Nelson, J. (1995). It's up to me!  
 Ruck, S. B. (1998). Jonathan's Garden.  
 Schlessinger, L. C. (2001). Growing Up is Hard.  
 Taylor, K. N. (1998). Right Choices.  
 Viorst, J., & Cruz, R. (1987). Alexander and the Terrible, Horrible, No Good, Very Bad Day.



### Down with Dictators!

One great way for a parent to learn about her child's understanding of rules is to allow her child to make up rules. (This can also make a great activity.) Children can make up rules about playing with new toys, eating snacks, watching tv, or using the computer. By asking questions, parents learn what their child is thinking. For example:


- Why does your child think the rule is necessary?
  - What should happen if the rule is broken?
  - To whom does the rule apply?
  - Is the rule always true?
  - Does your child want you to enforce the rule?
- (Taken from Ready, Set, Go!)





## Great Ideas!

**M**embers of the Welcome Home group suggested some ideas for getting children involved with choices, rules and limits. Here are some of their suggestions:

- ▶ Make family rules together. Parents will need to steer the conversation so that children will have enough information to make fair and "safe" rules.
- ▶ Have a family night and invite your child to choose the treat! Your child can also help you pick out the items in the grocery store to learn about "grown-up" choices, or your child can help you make the treat.
 



During the making of the treat, you can discuss what would happen if you didn't put all the ingredients in so that your child can learn about the consequences of their choices.
- ▶ Give your child a responsibility. Invite them to choose a plant (like a pumpkin) or animal (like a fish) to take care of. They can learn about outcomes of their choices in taking care of something. They can also learn about making rules with the new item!
- ▶ Take a nature hike. Invite them to help you choose where to go, how long to be gone and what to bring. Invite them to create rules about going on the hike like how close everyone has to stay together.
- ▶ Give your child opportunities to resolve conflicts with her siblings or peers. Avoid taking sides. One mother suggested asking the children who are disagreeing to sit on a bench or 2 hard chairs until they resolve their conflict or tell what they have done wrong.
 

- ▶ Think of three things that your child loves to do like have a manicure or build mud houses or dance to the Beach Boys. Give your child the choice to do any one of these three things for ten minutes with you during the activity session! Remind them that there are no right and wrong options; this is a "preference choice."



- ▶ Play a game together. Try Uno! You can even create new rules for the game together.
- ▶ Go on a BEAR HUNT! Invite your child to lead you around the yard to find a bear. (He gets to choose the way.) Hide a stuffed bear in your yard. Go over rocks, behind cars, under a slide until you find the bear. When you find the bear, go back the way you came as fast as you can.
- ▶ Let your child choose what is for dinner one night. Invite your child to help you cook dinner. Talk to them about kitchen safety while you cook.



- ▶ Send a letter in the mail to your child to let them know how much you love them. When the letter arrives, read it to them if you wrote it or take about the picture you have drawn for them.
- ▶ Parents can read story or picture books to children emphasizing choices, rules, and limits.
- ▶ Children can "read" the pictures in a book and tell the parent a story. Parents can ask questions about choices, rules, and limits in the book.
- ▶ Children can make up a story about children making choices. Talk about possible outcomes.





# Social Times



Welcome Home: The Parent-Preschooler Connection

May 2001

## Connected!

### Sprint to the End!

On May 2, 2001, parents of the Weston Chapter of Welcome Home met for their third meeting. I have been so excited about all the great interactions that parents are having with their children. The feedback about the activities and the classes has been GREAT!

Only one month remains in this research project. Illness, trips, and life's surprises has made completing all the activities and attending meetings difficult. Now is the time to forget the past and step forward to a bright future—resolve this month to finish 12 activities with new enthusiasm!

Our final meeting will be held Wednesday, June 6th at 3:30 p.m. in the Weston LDS church building. I have some great activities and resources available for this last meeting. Remember to bring all your completed logs and tapes as well as the tape recorders if you borrowed them from me. I hope to see all of you there! *Monica J. Blanch*



### Super Centerpieces!

Nature provides some great opportunities for you to monitor your child's activities and to teach them to be safe. Try creating a vase out of a small jar, a baby food jar, or a sturdy plastic cup. Help your child decorate the "vase" with fabric scraps, wrapping paper, or thinned tempera paint. Tell your child your favorite thing about their vase. Then, go out and pick some flowers together. While you pick flowers, teach about "safe" plants as they create something beautiful!

### Tell me a Story!

Make a picture collection. Gather old magazines and Christmas or birthday cards. Have your child choose pictures to put in a picture box. As you look at the magazines talk about the messages that advertisers are making. For instance, if your child sees an ad for beer where everyone looks as if they are happy and popular, ask them if people really need to drink to have a good time. Ask them to list great times your family had together. Ask them if you needed beer then.

After your picture box is full, have your child choose a picture. Tell a story to your child about the picture. Choose a picture and have your child tell you a story about the picture.

### Treasure Hunting

Give your child an old shoe box to make a "treasure" box. Use collage materials like paper, rocks, string, yarn, fabric, buttons, pasta, foil, magazine pictures, or your child's picture to decorate the treasure box together. While you are working on the box together, talk to your child about "treasures" they could keep inside. After the box is done, invite your child to run and find one treasure to put in their box right then. When your child returns, ask them why you choose that item. This activity will help you learn more about what is important to your child!

(Idea taken from *The Month by Month Treasure Box: Crafty Things to do with Young Children* by Sally Patrick, Vicki Schwartz and Pat LaPresi.)



### Egg Cartons, Fabric, & Straws: Using Everyday Objects to Learn About Math

Parents do not need to purchase materials specifically for teaching their children. Creativity and everyday objects are sufficient to teach your child about the beauties of psychosocial development in preparing them for school. Here are some great ideas members of the Welcome Home group had to use everyday objects to teach their children! Try these great ideas:

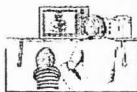


1. Play store using empty cereal boxes, milk jugs, or other household items.
2. Make a band together! Use old cans or oatmeal boxes with lids for drums. Make a tambourine out of 2 paper plates taped together with dry macaroni in the center. Construct sandpaper blocks out of smooth scraps of wood blocks and sandpaper. They make great sounds! (Some of these ideas were taken from *The Month by Month Treasure Box: Crafty Things to do with Young Children* by Sally Patrick, Vicky Schwartz and Pat LaPresti.)
3. Learn about other families' rituals. Create a headdress out of feathers you can find in your yard, beads, paper, etc. Paste them onto a headband or an elastic waistband sewn into a circle. Talk about some of your family's rituals.

### "Mediator" Words

Try using some of these words as you do your activities to help your children become more familiar with psychosocial vocabulary:

<i>right</i>	<i>wrong</i>	<i>trust</i>	<i>harmful</i>	<i>dangerous</i>
<i>safe</i>	<i>values</i>	<i>beliefs</i>	<i>customs</i>	<i>traditions</i>
<i>rituals</i>	<i>messages</i>	<i>meaning</i>	<i>good/bad</i>	



### Children's Books on Customs and Values

- Rogers, F. (2000). *The Giving Box: Create a Tradition of Giving with Your Children*.
- Ammon, R. (1998). *An Amish Wedding*.
- Berenstain, S. (1984). *The Berenstain Bears and Too Much TV*.
- Hargreaves, R. (1997). *Little Miss Curious*.
- Hargreaves, R. (1998). *Little Miss Trouble*.
- Hargreaves, R. (2001). *Mr. Mischief*.
- Miller, S. S. (1998). *Better than TV*.



*\*\*Find more books at your local library!*

### Mediating the Media!

Parents, bothers, sister, grandparents, people on TV, advertisers, and friends teach children about the world. A mediator intervenes between two parties. Your job as a mediator is to intervene between media, friends, and family messages and your child, so your child can interpret these messages with your family's values. As a mediator, you monitor what your child watches and hears and with whom they are spending time. Therefore, your child learns that not all ideas are of equal value; some are wrong.

Parents also mediate values through the traditions your family holds. Family rituals help children handle family stress and difficulty better. Some family rituals are everyday (i.e., setting the table, brushing the dog's fur, telling stories to each other). Other family rituals are based around holidays (i.e., making jack o'lanterns, decorating the Christmas tree, fireworks on the 4th of July). If your family doesn't have many family rituals, create a new one and start doing it for at least on of your activity sessions! :) (Taken from *The Ready, Set, Go!* Home Visitor's Guide.)



# Social Times



Welcome Home: The Parent-Preschooler Connection

June 9, 2001

## Thank You!

You are GREAT!

On June 6, 2001, parents of the Weston Chapter of Welcome Home met with Monica Blanch, a graduate student from Utah State University in Family and Human Development for their final meeting. Mothers were informed that:

- ▶ *all* psychosocial logs and audio tapes are due at this time,
- ▶ parents also need to *complete two forms*: a final attitudes measure and an evaluation of the program,
- ▶ *final testing* of the children will take place in July on two Saturdays (parents will be contacted within the next three weeks about arranging appointment times), and
- ▶ parents will *receive the results* of the testing within two weeks of when the testing is completed.

If you have any questions regarding any of this information or did not receive your materials, please contact Monica Blanch at 797-3925. Within the next week, she will be contacting all mothers who did not attend the final meeting and who do not call her before the next week.

## Final Farewell

I planned to give all the participants something special as a thank you for your willingness to

participate in my thesis research program, Welcome Home. Nothing I could buy on my college student budget could ever express my gratitude well enough. I have enjoyed working with all of you. I have learned so much. With all my heart, THANK YOU!  
-Monica



## The Journey Continues...



Many mothers in this program have expressed to me how much they have enjoyed doing activities with their children and how much their children have enjoyed doing activities with them. You have learned through this class to be more effective teachers of your children. You have participated in a variety of activities with your child. What are you going to do with your knowledge?

The goal is that you continue to look for opportunities to teach your children in everyday life. These experiences can come as children question, as you point out specific behaviors they are already doing, or as you sit down with your child in structured activity. Here are some resources where you can learn more about your child's development and more activities you can do with your child to prepare them for school and beyond. Check out:

1. The U.S. Department of Education at 1-877-4ED-Pubs or visit their web site at [www.ed.gov/pubs/edpubs.html](http://www.ed.gov/pubs/edpubs.html) to get a catalogue of free publications available. They have books about early childhood math, geography and reading.
2. The Dollar Store for workbooks. More expensive workbooks can be covered in contact paper and written in with dry erase markers to increase longevity.
3. Your local library or bookstore.
4. *Math and Science for Young Children (3rd ed.)*, by Rosalind Charlesworth and Karen K. Lind.
5. *Bite-Sized Science: Activities for Children in 15 Minutes or Less* by John H. Falk & Kristi S. Rosenberg
6. *The Parents' Resource Almanac* by Beth DeFrancis.
7. *365 TV-Free Activities You Can Do with Your Child* by Steven J. Bennett & Ruth Bennett
8. Search the web for these great sites:
  - ▶ <http://www.family.com>
  - ▶ [www.scholastic.com/parentandchild/index.htm](http://www.scholastic.com/parentandchild/index.htm)
  - ▶ [www.sesameworkshop.org/parents](http://www.sesameworkshop.org/parents)
  - ▶ [www.indiana.edu/~eric\\_ree](http://www.indiana.edu/~eric_ree) (monthly issues of *Parents and Children Together Online*)
  - ▶ [www.familit.org](http://www.familit.org)
  - ▶ <http://www.temc.edu/academia/earlychild.html#parent>
  - ▶ <http://teams.lacoe.edu/documentation/places/parents.htm>
  - ▶ [www.lovetolearn.com](http://www.lovetolearn.com)
  - ▶ <http://www.ycrpracticalpreschool.com/>

Appendix V. Psychosocial Development Lesson Plans

## Lesson 1

**Objective:** To help parents understand the role of self-esteem, discover the components of helping children feel safe and secure, and find ways to teach safety and security in their home using everyday items.

## Discussion Outline

## Materials Needed

<p><b>Introduction:</b></p> <p>Question/ Answer/ Share 5-10minutes</p>	<p><u>Getting to Know You Activity</u></p> <ul style="list-style-type: none"> <li>• Ask class members to stand in a circle. Pass a doll representing their 4 or 5 year-old child around the room. As each class member hold the doll, they will share their name and show with the doll what they like to do with their 4 or 5 year-old child.</li> </ul> <p><u>Introduction to the Structure of the Class</u></p> <ul style="list-style-type: none"> <li>• Discuss lesson plan outline. (Emphasize that we hope to dismiss class on time so that they will be able to return to their families when expected.)</li> <li>• Review of what will be expected of them.             <ol style="list-style-type: none"> <li>1. They will be required to attend all the monthly meetings.</li> <li>2. They will need to have triweekly activity sessions with their child at their convenience which last approximately 10 minutes.</li> <li>3. These activity sessions will be tape recorded. You will be provided with blank tapes. If you do not have a tape recorder, they will be available for you to borrow. These tapes will be turned in at the monthly parent meetings.</li> <li>4. They will complete an activity log at the end of each activity session. These logs will come with a stamped addressed envelop. These logs need to be sent in when complete.</li> </ol> </li> <li>• They will each receive a packet today. This packet will contain psychosocial development terminology guide, psychosocial development logs, instructions for tape recording the parent/child interaction sessions, and blank tapes.</li> </ul>	<p>Doll</p> <p>Packet: psycho- social develop- ment termin- ology guide, psycho- social develop- ment logs, instruc- tions for tape recording, blank tapes, tape recorders (?)</p>
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<p><b>Lesson Part I:</b></p> <p>Parents as Psychosocial Development Teachers Training</p> <p>15 minutes</p>	<p><u>Supporting Positive Self-Esteem</u></p> <ul style="list-style-type: none"> <li>• Ask parents to complete a "How I feel about myself" quiz. Show them how to score the "test."</li> <li>• Share personal experience about how my parents felt about themselves.</li> <li>• Ask: <b>What experiences do you think led to your feelings about yourself? How do you think your attitude about yourself affects your child?</b> (List their ideas on a piece of butcher paper.)</li> <li>• Parents Influence their Children's Self Concept           <ul style="list-style-type: none"> <li>* Parents who have a healthy self concept, compared to parents of children with poor self concept: show more love and acceptance in everyday expressions of affection; are less critical; set and enforce clear rules and expectation and are less permissive; listen to their children and take their opinions into account when there are disagreements.</li> </ul> </li> <li>• Ask: <b>What are some ways to support a positive self-esteem?</b> (List their ideas on a piece of butcher paper.) Some suggestions to promoting a child's self-esteem include: not making comparisons between children; treating sons and daughters equally; encouraging healthy friendships; helping children develop their interests and abilities (which may differ from the interests and abilities their parents want them to have) (Home Visitors Guide p. 18). IDEAS: children's books, night time ritual telling the child why they were proud of them that day, make-believe and puppet play interactions (Home Visitors Guide p. 19)</li> </ul>	<p>"How I feel about myself" quiz</p> <p>butcher paper, marker</p>
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<p><b>Lesson Part II:</b></p> <p>Concepts Parents Can Teach Training</p> <p>15 minutes</p>	<p><u>Safety and Security for Young Children</u></p> <ul style="list-style-type: none"> <li>• What is psychosocial development? <ul style="list-style-type: none"> <li>* Discuss psychosocial development categories that will be covered over the next three months: helping children feel safe and secure; helping children understand choices, rules, and limits; parents and children doing things together; and parents helping children by helping themselves (U.S. Dept. of Ed, 1993). All these categories help children make healthy decisions about their life now and in the future.</li> </ul> </li> <li>• Helping your child feel safe and secure can be divided into three parts... <ul style="list-style-type: none"> <li>* How you, as parents, protect your children</li> <li>* Building your children's confidence (as discussed in Lesson Part I)</li> <li>* Identifying your children's good qualities</li> </ul> </li> <li>• Define each of these the two additional concepts with examples (see <u>Ready, Set, Go</u>).</li> </ul> <p><b>*How you, as parents, protect your children:</b></p> <ul style="list-style-type: none"> <li>- Quotes from other parents across the country (page 4 <u>Ready, Set, Go for Parents</u>) <ul style="list-style-type: none"> <li>- Develop a family code word. <i>Think of a special word that all the members of your family can remember, and that isn't used in everyday life. This is your family's "code word" to use when there is danger present or when the family needs to come together in an emergency.</i></li> <li><i>"For example, suppose a family chooses SUNFLOWER as its code word. All members of the family agree that when any family member calls out SUNFLOWER, everyone else stops and comes together around the person who called out the word. Whether people are down the street, in the back yard, or upstairs playing, they all recognize that someone is in trouble or needs to have everyone together and this is more important than what they are doing right now. It could happen one-on-one, such as when a parent sees a child going up to a strange car, or starting to pick up a piece of broken glass."</i> PRACTICE USING THE CODE WORD IN YOUR FAMILIES.</li> <li>- What are some things that you will absolutely not let your preschooler do? Here are some examples of what other parents won't let their children do. Hold up a pair of scissors and say, "Some parents won't let their preschooler cut with scissors." Place other objects or pictures of things preschoolers shouldn't do on the table and list more rules other parents have.</li> </ul> </li> </ul> <p><b>* Identifying your children's good qualities</b></p> <ul style="list-style-type: none"> <li>- Every child is different. Even from birth children have different temperaments. These temperaments can not usually be changed no matter how much a parent rewards, punishes, encourages, or coaches. A shy child will never become completely outgoing, no matter how much a parent pushes. But, a child's behavior can be changed by being sensitive to the child's temperament. Keep in mind though that some behavior is development related and not personality. (Watch other children the same age to learn the difference.)</li> <li>- Show two dolls point out their differences. Show how each child has different strengths by reading 5 circles that describe them. <b>What are some good qualities in your child? How can you bring them out this week in one of your activity sessions?</b></li> </ul>	<p>flannel board and/or magnetic board, groups of 6 of objects, pictures of 2 and 6 of objects</p> <p>two dolls that are different from each other and 10 circles with one quote from "Some parents say..." (Home Visitor Guide, p. 9) on each circle</p>
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<p><b>Activity:</b></p> <p>Developing Psychosocial development Activities</p> <p>15-20 minutes</p>	<p><u>Sponges</u></p> <ul style="list-style-type: none"> <li>Give each parent ten sponges. Ask them to make different types people out of the sponges. These sponges can be used:           <ul style="list-style-type: none"> <li>at bath time, show positive interactions, (have one represent you and one represent them, have the parent sponge point out positive things in the child sponge), or</li> <li>at play time, give the child blank paper and paints to dip the sponges in and have them create a picture of themselves doing their favorite activity. You can create a picture of them too and point out their good qualities you made in the picture.</li> </ul> </li> </ul> <p><u>More Possible Activities for the Triweekly Activity Sessions</u></p> <p><i>This activity can be done while parents are working on their sponge people.</i></p> <ul style="list-style-type: none"> <li>Parents will be broken into small groups and asked to think of some activities they could do with their children related to helping children feel safe. <u>Ready</u> will be available as reference book. One member of the group will record the suggestions on butcher paper. The group will reconvene after 10 minutes and share their ideas with the class. Parents can make notes of these activities. These activity suggestions will be printed in the newsletter that will be published the next week.</li> </ul>	<p>ten sponges for each parent, scissors, markers</p> <p><u>Ready</u></p> <p>butcher paper, markers</p>
<p><b>Conclusion:</b></p> <p>Do you have any questions?</p> <p>5 minutes</p>	<p><u>Dear Gabby</u></p> <ul style="list-style-type: none"> <li>Distribute slips of paper to the class. Ask them to write any suggestions or questions that they have. These will be printed in the monthly newsletter. If their questions are expedient, invite them to stay after class and ask the questions to you individually. Thank them for coming and remind them of the next scheduled class time.</li> </ul>	<p>Blank pieces of paper, and pens or pencils</p>

**Processing Questions:**

- What is expected of you as a participant in this class?
- What is the role of parental attitude in a child's development?
- What does it mean for parents to protect their children, build their children's confidence, and identify their children's good qualities?
- What are some activities you can do with your child to help them develop a safe and secure environment for their child?

## Lesson 2

**Objective:** To help parents know more about their role as psychosocial development instructors. To help parents learn what choices, rules, and limits mean in their child's developmental scheme and activities they can do with their child to enhance this development.

## Discussion Outline

Materials  
Needed

<p><b>Introduction:</b></p> <p>Question/Answer/Share</p> <p>5-10minutes</p>	<p><u>Sharing Time</u></p> <ul style="list-style-type: none"> <li>• Explain to the parents that you will be throwing a ball around the room. Whoever catches the ball will share one of the most fun activities that they did since the last meeting. Then, that person will throw the ball to someone else in the class.</li> </ul>	<p>Ball</p>
<p><b>Lesson Part I:</b></p> <p>Parents as Psychosocial Development Teachers Training</p> <p>15 minutes</p>	<p><u>The Role of Parents as Formal Instructors</u></p> <ul style="list-style-type: none"> <li>• Ublick— Children are like ublick. The more that you work with them the stronger they become, but, when they are left alone, they become weaker. Children need their parents.</li> <li>• How to be a Good Teacher for Your Child (Fromboluti &amp; Rinck, 1999)             <ol style="list-style-type: none"> <li>1. Take advantage learning opportunities that happen naturally. (To be good teachers, parents do not need to write out lesson plans necessarily. Parents do need to take advantage of everyday situations to teach children to learn. For example, by helping sort the laundry, children learn to classify and sort.)</li> <li>2. Encourage your child to ask questions that require more than a yes or no.</li> <li>3. Encourage your child to think.</li> <li>4. Ask your child questions to get them thinking.</li> <li>5. Show respect for your child's thinking and point of view.</li> <li>6. Repetition is good. (By doing the same activities over and over, children understand better and better.)</li> <li>7. Move at your child's pace.</li> </ol> <p><u>What's the Use of Choices, Rules, and Limits: Who Really Cares or Uses This Stuff</u></p> <ul style="list-style-type: none"> <li>• Ask: Who uses choices, rules, and limits? Why are choices, rules, and limits important in development? What doors can they open?</li> </ul> </li> </ul>	<p>Ublick</p>

<p><b>Lesson Part II:</b></p> <p>Concepts Parents Can Teach Training</p> <p>15 minutes</p>	<p><u>Choices, Rules, and Limits</u></p> <ul style="list-style-type: none"> <li>Rules and limits protect children. Parents help children understand the role of rules and limits by helping them recognize that rules should not be broken, that limits mean children can't always do what they want, that some things can only be done at the right time in the right place, and that they can make some safe choices for themselves (Home Visitor Guide, p. 21).</li> <li>Defining terms: <u>Making Choices</u> Children need to make some choices on their own. Children need to know that you respect what they need and want. They feel more confident and better about themselves when you respect what they like. Some choices are <i>preference choices</i> which are neither right or wrong like their favorite color. Some choices are <i>thinking choices</i> which children need information about to get good or bad results like touching a hot stove. Children have more difficulties with thinking choices because they don't know about the world. Until they do, parents are responsible to see that their child does the right thing. <b>How do these five objects relate to the choices that your child makes?</b> The choices your child should be able to make are based on your beliefs, your child's skills, and the standards of your community.</li> </ul> <p><u>Setting limits</u> – Why do we have limits? “To keep [children] safe, keep others safe, help children learn the expectations of others and be liked by them, and make daily life easier” (Home Visitor Guide, p. 31).</p> <ul style="list-style-type: none"> <li>– Children need to know the limits. Punishing alone or requiring child to obey just because the parent is boss will only lead to lack of empathy toward others, low self-image, and decision making based on getting caught, rewarded, or punished instead of right or wrong. BEING WARM AND HAVING FUN TOGETHER HELP CHILDREN LEARN TO TRUST AND BE COMPLIANT. One way to have fun together is to make a macaroni necklace.</li> <li>– When you set limits, be fair, be clear, and be consistent.</li> </ul> <p><u>Making rules</u> – Why make rules? Parents make rules to keep children safe, protect others and their belongings, help children be accepted by the community, provide a convenience in day to day living, and help children think about social issues by letting them participate as much as possible in making rules.</p> <ul style="list-style-type: none"> <li>– Support rule making by: 1) taking responsibility (both you and child), 2) allowing children to make “safe” mistakes, 3) allowing children to resolve conflicts among themselves, and 4) allowing children to create rules in necessary situations like toy sharing or having snacks or watching tv.</li> </ul> <p><u>Appropriate behaviors</u> – Some behaviors are not <u>always</u> right or wrong; sometimes it depends on the situation. “Helping children learn about making social and physical judgements is much harder than helping them make rules” (Home Visitors Guide, p. 39). Use examples of exceptions (i.e., teeter-totter always goes down except...).</p> <ul style="list-style-type: none"> <li>– How to make wise decisions about prohibiting behavior (3 pts on pg 39)</li> </ul>	<p>5 objects: electric outlet cover, tv channel changer, clothes, candy, knife</p> <p>colored macaroni necklace</p> <p>map of how to support rule making</p> <p>teeter-totter scale; height chart; magazine hot/cold objects calendar example</p>
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<p><b>Activity:</b></p> <p>Developing Psychosocial development Activities</p> <p>15-20 minutes</p>	<p><u>Using Children's Books</u></p> <ul style="list-style-type: none"> <li>Using the children's book, <u>Denton's Detectives</u> show the parents how to use books to emphasize choices, rules, and limits and helping children feel safe. Have parents role play story reading interactions.</li> <li>Parents can also use other children's books that relate to helping children understand choices, rules, and limits and helping children feel safe. They can ask their local librarian for examples and look in the monthly newsletter for more suggestions.</li> </ul> <p><u>Graduated Cylinders</u></p> <ul style="list-style-type: none"> <li>Give each parent paper towel and/or toilet paper rolls. Parents can decorate these cylinders or make them into whatever the child would like with their children. Parents can use the roll decorating as one of their activities this week. Parents can emphasize children's choice of color and what to make of the cylinders. They can also talk about rules related to using scissors, glue or other decorating materials.</li> </ul> <p><u>Activity Ideas</u></p> <ul style="list-style-type: none"> <li>Invite each class member to write down three activities they can do this week which are patterning and ordering activities. If they get stumped invite them to talk amongst themselves to find more ideas. <u>Ready</u> by the Department of Education will be available as a reference book. These ideas will be returned to the teacher and printed in the monthly newsletter.</li> </ul>	<p><u>Denton's Detectives</u></p> <p>Paper towel rolls or toilet paper rolls for all the members of the class</p> <p>paper and pens or pencils for all members of the class</p> <p><u>Ready</u> by the Dept of Education</p>
<p><b>Conclusion:</b></p> <p>Do you have any questions?</p> <p>5 minutes</p>	<p><u>Dear Gabby</u></p> <ul style="list-style-type: none"> <li>Distribute slips of paper to the class. Ask them to write any suggestions or questions that they have. These will be printed in the monthly newsletter. If their questions are expedient, invite them to stay after class and ask the questions to you individually. Thank them for coming and remind them of the next scheduled class time.</li> </ul>	<p>Blank pieces of paper, and pens or pencils</p>

**Processing Questions:**

- What is the role of parents in teaching young children?
- How are choices, rules, and limits useful in all walks of life and throughout a lifetime?
- What concepts underlie choices, rules, and limits?
- How do you use children's books to teach choices, rules, and limits?

## Lesson 3

**Objective:** To help parents understand doing things with their children is important. To help parents understand and develop psychosocial development activities for their 4 or 5 year-old.

## Discussion Outline

## Materials Needed

<p><b>Introduction:</b> Question/Answer/Share 5-10minutes</p>	<p><u>Sharing Time:</u> Hot Potato</p> <ul style="list-style-type: none"> <li>Ask the parents to sit in a circle around the room. Pass a ball around the circle while music plays in the background. When the music stops, the person holding the ball will describe one fun math activity they have done with their child in the last month.</li> </ul>	<p>Ball, music tapes or CDs; tape recorder or CD player</p>
<p><b>Lesson Part I:</b> Parents as Math Teachers Training 15 minutes</p>	<p><u>Parents as Mediators</u></p> <p><i>If a car were speeding down the street toward your son, would you throw yourself in its path to push your child to safety? If a drug dealer tried to sell drugs to your daughter, would you jump in to stop the deal? Most parents would jump first, think later. They would just take action. Their desire to protect children is a natural part of being a mother or father (Home Visitors Guide, p. 19).</i></p> <ul style="list-style-type: none"> <li>Children receive messages from many sources, you, brothers and sisters, grandparents, people on TV, advertisers, and friends. Preschool children do not know how to sort through these messages, so it is your job to mediate these message to help them see which are good and which are not good. <b>What is a mediator?</b></li> </ul> <p><b>**To be a good mediator, you must monitor what children watch and hear and know with whom they are spending time.**</b></p> <p><b>How does mediating messages for your children help them?</b></p> <ul style="list-style-type: none"> <li>children learn that all ideas are not of equal value; some are wrong</li> <li>children learn to trust parents in the long term because you are protecting them</li> <li>children learn how to evaluate new ideas and take stands against things that are harmful</li> </ul> <p><b>**Pick good shows (see guidelines p.55 in Home Visitors Guide). Think of the shows your child watches. Do they fit in these guidelines? (Thinking question.) Sit down with your child this month and mediate the shows they are watching for one or more of your activities.</b></p>	<p>Write the guidelines for picking appropriate TV shows (Home Visitors Guide, p. 55) on a piece of butcher paper</p>

<p><b>Lesson Part II:</b>          Concepts Parents          Can Teach Training          15 minutes</p>	<p><u>Parents and Children Doing Things Together</u></p> <p>Invite the parents to get into groups of two. Blindfold one parent in each group. Invite the second parent to time the blindfolded parent as they go through an obstacle course. But, tell the second parent not to give clues about getting through an obstacle course. Time the parents a second time, but this time the blindfolded parent can get any help from the first parent that the second parent will give. <b>Which way works better? Why? How does this relate to your relationship with your child?</b></p> <ul style="list-style-type: none"> <li>• Sharing activities allow children to get the adult attention that they need. Some activities you do with your child are child-centered (i.e., reading a book or watching tv) while some activities are parent-centered (i.e., cooking, shopping, banking). Child-centered activities help your child know you are interested in their activities. Parent-centered activities help children learn about their role and value in the family to prepare them for when they get older.</li> </ul> <p>Creating family rituals and sticking to them help children handle family stress and difficulty better. Family rituals can be on holidays (**My favorite memory: hide the hearts game at Valentines as a tradition in my family) or everyday (setting the table, brushing the dog's fur, telling stories to each other).</p> <p><b>What are some family rituals you have in your home?</b></p>	<p>set up          obstacle          course</p> <p>shape          examples-          hearts</p>
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<p><b>Activity:</b> Developing Math Activities 15-20 minutes</p>	<p><u>Empty Cans</u></p> <ul style="list-style-type: none"> <li>• <b>How can these cans be used in an activity with your child?</b> (List ideas on a piece of butcher paper.) Playing phones, Making music, Telling stories</li> <li>• Decorate the cans</li> </ul> <p><u>More Possible Activities for the Triweekly Activity Sessions</u></p> <p><i>This activity can be done while parents are working on their cans.</i></p> <ul style="list-style-type: none"> <li>• Parents will be split into groups and given a list of household items that could be used as in their psychosocial development activities. Invite parents to think of some activities they could do with their children related these common objects and to the ideas learned in this lesson or in previous lessons. <u>Ready</u> by the Department of Education will be available as reference book. One member of the group will record the suggestions on the list beneath each item. The group will reconvene after 10 minutes and share their ideas with the class. Parents can make notes of these activities. These activity suggestions will be printed in the newsletter which will be published the next week.</li> </ul>	<p>Butcher paper; markers</p> <p>paint, paper, glue, scissors, markers, glitter</p> <p>list of household items (Charlesworth and Lind, p. 510) typed with space to write beneath each item; pens</p> <p><u>Ready</u> by the Dept of Education</p>
<p><b>Conclusion:</b> Do you have any questions? 5 minutes</p>	<p><u>Dear Gabby</u></p> <ul style="list-style-type: none"> <li>• Distribute slips of paper to the class. Ask them to write any suggestions or questions that they have. These will be printed in the monthly newsletter. If their questions are expedient, invite them to stay after class and ask the questions to you individually. Thank them for coming and remind them of the next scheduled class time.</li> </ul>	<p>Blank pieces of paper, and pens or pencils</p>

**Processing Questions:**

- How are parents mediators to their children?
- Why is it important for parents to share time with their children?
- Why are family rituals important?
- What are some activities for young children with everyday household items which will strengthen their psychosocial development?

## Lesson 4

**Objective:** To encourage parents to continue teaching children after the class no longer meets.

*Discussion Outline**Materials Needed*

	<i>Discussion Outline</i>	<i>Materials Needed</i>
<p><b>Introduction:</b> Question/Answer/ Share 5-10minutes</p>	<p><u>Sharing Time</u></p> <ul style="list-style-type: none"> <li>My Favorite Part Musical Chairs: Invite the parents to arrange their chairs into a circle. Remove one chair from the circle. Turn on some music and have the parents walk around in the circle until the music stops, then they must sit down. Whomever is standing shares with the class their favorite part about participating in this program.</li> </ul>	<p>Tape player and music tape</p>
<p><b>Lesson Part I:</b> Parents as Math Teachers Training 15 minutes</p>	<p><u>Teaching Resources: Keep Teaching Though Class is Over</u> So, you want to know more about your child's psychosocial development? Try these sources:</p> <ul style="list-style-type: none"> <li>Department of Education—<a href="http://www.ed.gov/pubs/parents/">http://www.ed.gov/pubs/parents/</a> or 1-877-4-ED-PUBS (877-433-7827).</li> <li>Krueger, C. W. (1999). <u>1001 Things to Do with Your Kids</u>. New York: BBS Publishing.</li> <li>Try this web site under activities: <a href="http://www.family.go.com">www.family.go.com</a></li> <li><b>Do you have any other ideas about where parents can go to learn about activities they can do with their children to promote optimal development?</b></li> </ul>	
<p><b>Lesson Part II:</b> Concepts Parents Can Teach Training 15 minutes</p>	<p><u>Learning in Everyday Life</u> Through this class you have learned to be a more effective teacher for your child. You have learned the basic components of math development. You have participated in a variety of activities with your child. What are you going to do with your knowledge? Keep looking for opportunities to teach your child in everyday life. These experiences can come as children as questions, as you point out specific behaviors they are already doing, or as you sit down with your child in structured activity.</p> <ul style="list-style-type: none"> <li><b>What benefits have you received from participating in this class? What benefits has your child received by participating in this class?</b></li> <li>Thank you for participating. This has been so much fun.</li> </ul>	
<p><b>Activity:</b> Developing Math Activities 15-20 minutes</p>	<p><u>Info Exchange</u> Invite the parents to visit and exchange phone numbers so that they will continue to have a network in which to share their ideas and ask questions to others that understand.</p>	<p>Name and Phone lists</p>



<b>Conclusion:</b> Questions 5 minutes	<u>Sincerely, Gabby</u> <ul style="list-style-type: none"><li>• Teacher and program evaluation. What have you learned? What do you wish would have been better?</li></ul>	Evaluation Sheet
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**Processing Questions:**

- Where can you go to get more information and ideas about teaching your children as they grow older?
- How does learning fit in everyday life?

Appendix W. Sample Activity Lesson Plan

## Measuring Munchies

**Math skill you are teaching:** Measuring

**Materials:** Carrot, Celery, or Zucchini Sticks; apple slices; orange segments

**Try using these math words:**

- long, longer, longest
- short, shorter, shortest
- measuring
- ruler



**What to do:**

Say, "Today we are going to measure. Grownups measure with a ruler, but today we are going to measure with an apple slice. See this apple slice. Your finger is one apple slice long. This spoon is one, two apple slices long. How many apple slices tall is your cup? Let's measure and find out!" When your child is more comfortable, he will be able to measure lots of things in your house all by himself, but, at first, he will need your help.

***My child is bored with this activity, what do I do?***

*This activity may be too easy for your child. Try this activity instead. Show your child a ruler. Say, "See this ruler. What does it have on it?" After the child responds, say, "Right. There numbers on a ruler. These numbers can be used to measure things. The distance from here to here, from one number to the next number, is one inch. Today we are going to measure carrot sticks." Measure one carrot stick while the child watches. Say, "This carrot stick is three inches long." Invite your child to measure the zucchini sticks, apple slices, or anything!*

***My child is frustrated with this activity, what do I do?***

*This activity may be too difficult for your child right now. Try this activity instead. Hand your child three celery sticks of various lengths. Say, "We are going to put these celery sticks in order from shortest to longest." Ask your child to hand you the longest celery stick. Say, "Now which celery stick is the longest." Put the three celery sticks in order from shortest to longest. Say, "This celery stick is short. This next celery stick is longer. The last celery stick is the longest." Hand your child three more celery sticks. Say, "Now, can you put these celery sticks in order from shortest to longest? Let me know if I can give you a hint."*