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## Maternal Scaffolding and First Graders' Near and Far Transfer on Problem-Solving Tasks

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MATERNAL SCAFFOLDING AND FIRST GRADERS' NEAR AND  
FAR TRANSFER ON PROBLEM-SOLVING TASKS

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A Thesis  
Presented to the  
Faculty of  
California State University,  
San Bernardino

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts  
in  
Child Development

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by  
Andria Rene Clausell

June 2016

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## ABSTRACT

This study examined correlations between four dimensions of maternal scaffolding, maternal beliefs and values, children's temperament, and children's performance and use of self-regulation strategies on problem-solving tasks. There are two foci of this study: examining factors that predict the quality of maternal scaffolding, and assessing the relationship between quality of maternal scaffolding and children's problem solving. Participants consisted of 10 mother-child dyads in the experimental group and 10 children in the control group. Using a pre- and post-test design, children were given near and far transfer independent problem-solving tasks. The experimental group also worked with their mothers on one task during a scaffolded interaction. Maternal beliefs predicted quality of maternal scaffolding, and quality of maternal scaffolding predicted children's monitoring during the post-test. Mothers' scaffolding techniques appear to be related to their beliefs about parenting and educating children, and children appear to learn certain self-regulation strategies during optimal scaffolded interactions.

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## DEDICATION

I would like to dedicate this thesis to all who work in the early childhood field. Each of you makes a lasting impact on the lives of the children and families you serve!

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## CHAPTER ONE

### REVIEW OF THE LITERATURE

Within the study of child development, problem solving refers to behaviors and mental activities employed by the child in attempting to solve problems that do not have routine or familiar solutions. Problem solving contributes in important ways to cognitive development. (Rogoff, 1990). Aspects of problem solving include remembering, planning, and categorizing. Problem solving typically has a specific purpose and it can be used to achieve a variety of goals. Some examples of goals that can be accomplished using problem solving are finding one's lost keys, completing a puzzle, answering a math equation, or planning a birthday party. Researchers interested in problem solving have presented children with semi-contrived tasks in laboratory settings, but have also studied how children define and solve problems arising within everyday life (Rogoff, 1990).

Problem solving constitutes a critical set of skills for children to develop if they are to succeed in academic settings. In school, children are expected to solve various problems independently. One of the ways in which children develop independent problem-solving skills is through scaffolded interactions with an adult or a more advanced peer. Scaffolding is a form of sociolinguistic support provided by someone who is more sophisticated than the child in the skill being acquired. Scaffolding allows the child to solve a problem, complete a task, or accomplish a goal collaboratively at a time when the child is not yet

capable of independent success (Wood, Bruner, & Ross, 1976; Wood, Wood, & Middleton, 1978; Wood & Wood, 1996).

The construct of scaffolding, as currently employed in the literature, originated with the research of Wood, Bruner, and Ross (1976) on how best to support children's acquisition of problem solving skills and derives from Vygotsky's sociocultural or social constructivist theory of cognitive development. Vygotsky claimed that children's intellectual abilities represent a culture-specific 'mental tool kit' acquired through guided interactions with more advanced members of the child's culture. Vygotsky also contributed the concept zone of proximal development, which is an important aspect of scaffolding. According to Vygotsky (1978), the zone of proximal development represents the distance between the child's current independent problem solving abilities and the potential skills the child can develop under the direction of an adult or more skilled peer. The zone of proximal development includes the child's current skill level as well as the problem-solving skills the child is developing. Scaffolding is instrumental to the zone of proximal development in that it helps to create an environment in which key problem-solving skills are fostered and internalized.

One of the most important findings in the problem-solving literature is that the type of support provided to the child within the zone of proximal development is crucial in determining whether or not, and to what degree, the target skill will be internalized by the child. Wood and colleagues

demonstrated empirically that children's independent performance on a problem-solving task was dependent on the level of instruction given by mothers in their efforts to guide their child's learning. The four levels of instruction observed by Wood and colleagues during mother-child interactions were demonstration, verbal, swing, and contingent shifting (Wood et al., 1978). Mothers' use of *contingent shifting* during the interaction was found to be the most optimal of the four levels of instruction and led to children performing better on independent problem-solving tasks. Contingent shifting is similar to Vygotsky's zone of proximal development. During a contingent shift interaction, instruction given to the child is dependent on the child's performance (Carr & Pike, 2012; Wood et al., 1976). When the task is too challenging for the child, the child is given help in order to reduce task difficulty and to allow the child to concentrate on his or her abilities. As the child becomes more skilled in the task, the individual overseeing the task progressively withdraws their help allowing the child to work more independently. Working within the zone of proximal development, an adult or more skilled peer assists the child in solving problems that require strategies that the child has yet to develop.

The use of contingent shifting, or gradually withdrawing support as the child becomes more skilled, helps promote children's autonomy (Neitzel & Stright, 2003). This shift of responsibility from the parent to the child is also related to children's task persistence and active involvement with the task.

According to Neitzel and Stright (2003), parents who are very controlling during a scaffolded interaction tend to have children who are passive during the learning process. Contingent instruction is crucial to children's success in the school setting. Mattanah, Pratt, Cowan, and Cowan (2005) found that mothers' use of contingent instruction was related to children's successful completion of problem-solving tasks, and to children's math abilities, as well as teacher and children's reports of academic achievement. Mothers' use of contingent shifting was also positively correlated with the extent to which children expressed confidence in their own academic abilities (Mattanah et al., 2005). In addition to teaching children to become independent problem solvers, this contingent approach to scaffolding may help children believe in themselves and in their academic abilities.

Since the seminal research of Wood and colleagues on the use of contingent instruction, studies have found other scaffolding behaviors to be vital to children's future success in independent problem solving. According to Stright, Herr, and Neitzel (2009), parents optimally scaffold their children's problem-solving abilities by providing *cognitive support* and *motivational support*, i.e., praising and encouraging their child to finish the task. Parents provide cognitive support by breaking the problem down into steps and by using simplified instructions that are developmentally appropriate for the child (Stright et al., 2009). When providing cognitive support, parents first observe their child's skill level and then reduce the cognitive demands of the problem

accordingly by guiding the child through a step-by-step process for completing the task. Stright et al. (2009) found that children's reasoning skills in kindergarten were effectively predicted by the extent to which mothers provided cognitive support during a problem-solving task. Guidance in completing difficult tasks provides children with problem-solving models that they will be able to apply in school settings making them more successful in school. Parents also scaffold their children by encouraging them and providing other forms of motivational support as they work on a task. According to Stright et al. (2009), parents can encourage their children to complete or continue working on a difficult task through praise or criticism. Praise is especially helpful when children are working on a challenging task. This encouragement may motivate children to continue working on a task. By contrast, criticizing children's performance outcomes may discourage them from working on the task and may cause them to doubt their abilities.

Most research conducted on parent-child scaffolded interactions have examined maternal scaffolding in relation to children's performance on a task. In a small number of studies, paternal scaffolding has been examined in comparison to maternal scaffolding. Mattanah and colleagues (2005) found that mothers' use of contingent shifting was associated with children's successful completion of the problem-solving task, children's high scores on the math achievement test, and with teacher and children's reports of academic competence. Fathers' use of contingent shifting was also associated

with children's successful completion of the problem-solving task, and with children's high scores on the math achievement test; however, fathers' contingent shifting was not closely associated with children's confidence in their own academic abilities. Gauvain, Fagot, Leve, and Kavanagh (2002) found very few differences in the type of instruction that mothers and fathers provided to their children during problem-solving tasks. Based on the results from these two studies, it appears that both maternal and paternal scaffolding predict children's performance on problem-solving tasks, and mothers and fathers instruct their children similarly on cognitive tasks. However, recent findings indicate that the contributions of paternal scaffolding depend upon the quality of maternal scaffolding. Paternal scaffolding has shown to be most beneficial to children's cognitive development when mothers use poor scaffolding. Martin, Ryan, and Brooks-Gunn (2010) found that when mothers used optimal scaffolding behaviors, fathers' scaffolding behaviors did not add to the prediction of children's academic abilities in kindergarten. However, when mothers used poor scaffolding, fathers' scaffolding predicted children's academic abilities in kindergarten. Based on these findings, fathers' scaffolding behaviors appear to be the most beneficial to children's cognitive abilities when mothers engage in poor scaffolding. Given that maternal and paternal scaffolding appear to impact children's performance on problem-solving tasks similarly and that paternal scaffolding yields the greatest child benefits when maternal scaffolding is less than optimal, for the purposes

of this study, only maternal scaffolding will be examined in relation to children's performance on problem-solving tasks.

### Maternal Scaffolding and Children's Behavior on Problem-Solving Tasks

While maternal scaffolding behaviors during a joint problem-solving task have been studied extensively (Carr & Pike, 2012; Mulvaney et al., 2006; Neitzel & Stright, 2003; Neitzel & Stright, 2004; Salonen et al., 2007; Stright et al., 2009), far fewer studies have examined how maternal scaffolding is related to *children's performance* on problem solving tasks (Conner & Cross, 2003; Gauvin & Fagot, 1995; Mattanah et al., 2005). Conner and Cross (2003) found that mothers' success in supporting their children's efforts during joint tasks predicted children's performance on independent problem-solving tasks. Gauvain and Fagot (1995) found that children who actively participated on more challenging aspects of a problem-solving task during mother-child scaffolded interactions performed better on a similar independent problem-solving task. Finally, Mattanah and colleagues (2005) found that mothers' use of contingent shifting during scaffolded interactions predicted children's success when working independently. Based on these findings, it appears that when children experience competently scaffolded interactions with their mothers, they are able to transfer the skills and strategies they learned to other problem-solving tasks. Transfer is a way to examine children's learning and is determined by children's ability to perceive similarities between

tasks and contexts (Brownell, Mellard, & Deshler, 1993). Transfer is the process of children generalizing prior knowledge to familiar or new problems and contexts (Kapa, 2007). Depending on how similar the joint (i.e., scaffolded) and independent problem-solving tasks are, one of two types of transfer can occur: near transfer or far transfer. Near transfer occurs when children perform on a task that is similar to previous tasks (Perry, 1991). Far transfer is performance on tasks that differ from previous tasks and require different solutions. Perry (1991) found that fourth and fifth-graders who were literally told how to complete a task rather than being allowed to figure out how to complete the task on their own performed poorly on transfer tasks. Research on the relationship between maternal scaffolding and children's performance on near and far transfer problem-solving tasks is still relatively limited. The present study will seek to establish whether or not maternal use of effective scaffolding is associated with more effective problem solving on both near and far transfer tasks.

### Parental Beliefs and Values

Research has shown that parental beliefs and values influence parental behaviors and parent-child interactions (Ricco, Sabet, & Clough, 2009; Rodriguez & Olswang, 2003; Keels, 2009; Sy & Schulenberg, 2005). According to Rodriguez and Olswang (2003), beliefs are created through life experiences, are shaped by one's knowledge, are not required to be factual, and have been found to be related to children's developmental outcomes.

Parents' beliefs about how children learn and develop may influence how parents interact with their children as well as the type of activities and learning opportunities they try to create. Sy and Schulenberg (2005) found that parents' beliefs about their child's education predicted how often parents read to their child and how involved parents were in their children's schooling. Values are principles that parents deem highly important and use to set developmental goals for their children (Suizzo, 2007). Like beliefs, parents' values may influence several aspects of their parenting behaviors, including the strategies and methods parents use to facilitate the development of particular skills in their children (Richman & Mandara, 2013; Rodriguez & Olswang, 2003; Rogoff, 1990). Previous research has found a correlation between maternal values and parenting practices (Luster, Rhoades, & Haas, 1989). Specifically, mothers who highly valued conformity were found to exert high parental control, enforce strict limits, were harsh disciplinarians, and were low in responsiveness. Research has shown that parents who value autonomy in learning tend to be less strict in their parenting (Richman & Mandara, 2013). Parents who value autonomy may allow their children to contribute to the decision-making process within the family as a way of supporting their children's independence. Parents who value autonomy also view children as active in their own learning. Such parents encourage their children to think of academic tasks as opportunities to learn and improve rather than as performance assessments or indicators of self-worth (Ricco et al., 2009).

Parents who respect their children's autonomy while setting clear and reasonable rules have been found to engage in behaviors that appear to promote language and cognitive development. These behaviors include providing process-oriented feedback and praise, labeling children's errors as part of the learning process, and using more indirect forms of support when assisting on homework. These behaviors resemble the attributes of effective scaffolding described earlier in this discussion. Despite this resemblance, not much research has been conducted on how parental beliefs and values influence parents' scaffolding behaviors per se. One objective of this study is to examine the relationship between parental beliefs, values, and the ways in which mothers scaffold their children during a problem-solving task. It is expected that parent beliefs in active learning and parent respect for children's autonomy will be associated with the use of contingent shifting, cognitive support (breaking the problem down into steps), and strategic encouragement.

#### Children's Temperament and Maternal Scaffolding Behavior

Studies have shown that children's temperament can influence how much assistance mothers provide their children during a scaffolded interaction (Gauvain & Fagot, 1995; Neitzel & Stright, 2004). Whether the child has an easy or difficult temperament can influence how little or how much instruction their parents provide during a scaffolded interaction. Gauvain and Fagot (1995) found that toddlers with difficult temperaments were less compliant than those with easy temperaments. Mothers of toddlers with difficult

temperaments provided more cognitive support, were much more critical of their child's performance, and completed more parts of the task for their child (including the more challenging components) than mothers of toddlers with easy temperaments. Another study conducted by Fagot and Gauvain (1997) found that infants who were reported to have a difficult temperament engaged in more off-task behaviors during a joint problem-solving task at 2.5 years of age. It was also found that mothers of children with difficult temperaments provided substantial cognitive support and verbalized the actions required to complete the task rather than encouraging the child to complete the task on their own. Mothers of children with difficult temperaments may become frustrated and impatient during the scaffolded interaction due to their child's noncompliance and off-task behavior. This can lead to mothers taking over the task or telling the child the solution to the problem instead of encouraging the child to actively participate in completing the task. When mothers control the task during a scaffolding interaction with their child, their child may not learn the strategies needed to complete the task, which can become an issue when the child is required to work independently on a task.

Neitzel and Stright (2004) found that mothers of school-aged children with difficult temperaments were less likely to instruct their children in simple steps and review the steps during a problem-solving task. Neitzel and Stright (2004) also found that mothers of children with difficult temperaments were less likely to praise their children during the task, and were more likely to

criticize their child's performance on the task. Lastly, mothers of children with difficult temperaments were more likely to complete the task for the child, control the child's actions in completing the task, or tell the child specifically what to do to complete the task instead of prompting and questioning their child about possible solutions to the problem. Mothers who take over a task instead of encouraging their child to complete the task may interfere with their child's ability to acquire problem-solving strategies. Mothers who are critical of their child when helping them on a task may discourage their child from applying themselves and trying to successfully complete the task. This discouragement may also cause children to question and doubt their abilities.

Not all studies report significant findings regarding child temperament and mother's use of scaffolding. For example, Mulvaney, McCartney, Bub, and Marshall (2006) found that temperament at 6 months of age did not predict behaviors or outcomes of mother-child scaffolded interactions when children were in first grade. Thus the literature in this area shows mixed findings. In addition, while several studies focus on temperament in very young children, fewer studies examine this variable in school-aged children. Another goal of the current study is to find additional confirmation that there is a correlation between school-aged children's temperament and how mothers scaffold their children during a problem-solving task. According to Piaget, school-aged children transition from the pre-operational stage to the concrete operational stage (Piaget, 1964). During this stage of cognitive development, children are

no longer egocentric in their thinking and children are better problem-solvers since their thinking is more logical and they are able to systematically manipulate symbols related to physical objects. School-aged children are also able to engage in operational thinking, which allows them to reverse mental actions. The children used in this study will be 6-7 years of age meaning that they will be beginning formal schooling and will have just entered the concrete operational stage. By working with this age group, basic competence in problem solving and in understanding task instructions can be reasonably assumed whereas problem-solving skills acquired through formal schooling are minimalized. Also, the problem-solving tasks utilized in this study are appropriate for this age group.

#### Children's Self-Regulation and Maternal Scaffolding

Vygotsky (1978) held the belief that parents contribute to children's development of self-regulation in part through scaffolding. The ways in which parents help their children think of solutions to a problem, attend to key aspects of a task, and encourage their children to complete a task may contribute to children's development of self-regulation. Self-regulation encompasses many areas; however, the three areas that will be measured in this study are metacognitive talk, monitoring progress, and task persistence (Neitzel & Stright, 2003; Ponitz & McClelland, 2009).

Metacognitive talk refers to children explaining their own thinking and guiding their behavior during performance (Neitzel & Stright, 2003). Children

engage in metacognitive talk when they make task-relevant comments while working on a task and when they discuss how they solved a problem or used a certain strategy to complete a task. The type of instruction parents use during scaffolded interactions may contribute to children learning to utilize metacognitive talk. Research has shown that mothers who provide step-by-step instructions that their children can comprehend have children who are more likely to engage in metacognitive talk (Neitzel & Stright, 2003). Mothers who give instructions in simplified steps and at a developmentally appropriate pace have been shown to have children who listen to instructions, and apply instructions to themselves through the use of metacognitive talk (Stright, Neitzel, Sears, & Hoke-Sinex, 2001). When mothers explain how to solve a problem at a child's level, this may allow the child to create an internal model of problem-solving strategies that they can use when working on a task independently.

Metacognitive talk may also be related to children's monitoring of their progress. Self-monitoring is another aspect of self-regulation. When children discuss the steps used to try to solve a problem, they can retrace their steps to see where a mistake was made. Children engage in self-monitoring when they check their work, identify errors, and correct their work (Stright et al., 2001). Stright and colleagues (2001) found that during scaffolded problem-solving tasks, mothers who stated instructions in a manner that their child could understand and who provided motivational support had children who

monitored their progress when working independently on schoolwork. When mothers provide developmentally appropriate instructions, they reduce the cognitive load for their child, which may free up cognitive resources that could be devoted to self-monitoring and other aspects of self-regulation. Contingent shifting may also contribute to children's monitoring. When mothers progressively transfer responsibility to their child during scaffolded interactions, the child may gradually assume the same monitoring and guiding role toward himself that the mother had been performing during joint problem solving.

Task persistence refers to a child's continued effort and sustained interest when working on a task (Neitzel & Stright, 2001). If a child is not motivated to work on a task, the child may not succeed in completing it. Neitzel and Stright (2001) found that when mothers were high in motivational support, their children were likely to remain interested and to continue working on their classwork regardless of the level of support the mother provided during the joint problem-solving task. When mothers were low in motivational support and high in cognitive support on difficult aspects of the joint problem-solving task, children demonstrated sustained effort on school assignments. Neitzel and Stright (2001) also found that mothers who successfully transferred responsibility during the joint problem-solving task and encouraged their child's autonomy had children who remained interested in and worked diligently on their schoolwork. Mothers' motivational support may

also serve as a model for how children can provide encouragement to themselves, helping to build their confidence. When working independently on a task, children may encourage themselves to put forth their best effort.

Mothers who engage in at least one aspect of optimal scaffolding when working with their child on a task may help their child develop the ability to remain focused on a task and to continue working on a task until it is completed. These are key elements of self-regulation. This study seeks to examine the relationship between maternal scaffolding behaviors (contingent shifting, cognitive support, and motivational support) and children's self-regulating behaviors including metacognitive talk, monitoring, and task persistence.

### Current Study

The purpose of the current study was to examine: 1) how mothers' beliefs and values, and children's temperament predict maternal scaffolding behaviors, 2) how maternal scaffolding behaviors predict children's self-regulation, and 3) how maternal scaffolding predicts children's performance on near and far transfer problem-solving tasks. First graders in the control group completed three problem-solving tasks independently—a pretest, and two posttests featuring near and far transfer. Their performance was assessed during each task. During the posttests, first graders use of self-regulation strategies (i.e., metacognitive talk, monitoring progress, and task persistence) was assessed. First graders in the experimental group

completed four problem-solving tasks. This included the tasks performed by the control group. It also included an additional task following the pretest. On this task, the children worked with their mothers in solving a problem. During the joint task, observers coded maternal scaffolding behaviors and assessed children's task performance based on the scaffolding behaviors of cognitive and motivational support. Following the joint problem solving task, first graders in the experimental group worked independently on the same near and far transfer task employed in the control condition. Their performance was assessed during each task. Children's use of self-regulated strategies based on the scaffolding behaviors of cognitive support and motivational support were also assessed. Mothers completed the Children's Behavior Questionnaire, the Parental Modernity Scale, the Rank Order of Parental Values, and a demographics questionnaire while their children worked on the independent problem-solving tasks. The following hypotheses were tested in this study:

- 1) Mothers who hold progressive, democratic beliefs and values centering on a respect for children's autonomy and self-directed behavior will use optimal scaffolding, including contingent instruction, cognitive support, and strategic encouragement.
- 2) Mothers who hold more traditional, authoritarian beliefs and who value their children's conformity will use less than optimal

scaffolding, including controlling the task, providing less cognitive support, and criticizing their child's performance.

- 3) Mothers of children with easy temperaments will use more optimal scaffolding, and mothers of children with difficult temperaments will use relatively less than optimal scaffolding.
- 4) Children's performance on independent problem-solving tasks will be associated with maternal scaffolding behaviors during the joint problem-solving task. Specifically, it is hypothesized that children whose mothers use optimal scaffolding will be more successful in completing near and far transfer problem-solving tasks than will children whose mothers use less optimal scaffolding.
- 5) It is expected that children whose mothers employ more effective scaffolding will use more self-regulated strategies based on the scaffolding behaviors of contingent shifting, cognitive support, and motivational support. Specifically, it was hypothesized that children of mothers who use optimal contingent shifting, cognitive support, and motivational support will engage in more metacognitive talk, will monitor their progress, and will sustain interest and effort on the independent problem-solving tasks.
- 6) Finally, children in the experimental group are expected to have higher performance on each of the independent problem-solving

tasks, and will use more self-regulation strategies than children in the control group.

## CHAPTER TWO

### METHOD

#### Participants

The participants in this study were 10 mother-child dyads, who served as the experimental group, and 10 children who served as the control group. Participants were selected from children who currently attend an elementary school in a low socioeconomic status area in San Bernardino County. Child participants were required to be in the first grade, fluent in the English language, and to read at grade level. Mothers were also required to be fluent in the English language. Child participants' ages ranged from 6-7 years, and mothers' ages ranged from 24-41 years. All participants were treated in accordance with the ethical guidelines of the APA (American Psychological Association, 2015).

Verbal assent was obtained from all child participants. The assent statement for children in the experimental group appears in Appendix A, and the assent statement for children in the control group appears in Appendix B. In accordance with the requirements of the University's Institutional Review Board, this statement included a brief description of what the child would be asked to do and what the researcher's role in the procedure was. Each child was assured that the procedure is not an assessment of the child in any way. In addition, the assent statement informed the child that he or she will be observed, let the child know who would be observing them, and explained why

this is being done. Finally, the researcher provided the child with an opportunity to ask questions before giving assent. Consent forms (see Appendix C) and recruitment letters for each group were sent home after the researcher made an announcement in the class (see Appendix D for recruitment script used for classroom announcements). The consent forms and recruitment letters for the experimental group were printed on blue paper (see Appendix E for experimental group recruitment letter), and consent forms and recruitment letters for the control group were printed on white copy paper (see Appendix F for control group recruitment letter). Consent forms were randomly passed out to the children. The informed consent included the researcher's contact information and a brief description of the study. The consent form also discussed confidentiality and the participant's rights. Lastly, the consent form for the scaffolding group provided an area at the bottom of the page for the mother to sign and date consenting to her own participation and to her child's participation. The consent form for the control group provided an area at the bottom of the page for the parent to sign and date consenting to their child's participation. Mothers in the scaffolding group were given a pencil and paper demographics questionnaire (see Appendix G) to collect information regarding their age, marital status, socioeconomic status including income level and educational level, ethnicity, the gender of their child participating in the study, family size, and birth order. After completing the study, a researcher read a debriefing statement to the child participants in

each group (see Appendices H and I). Mothers were also given a debriefing statement (see Appendix J). As an incentive for participating in the study, mothers were given a snack of their choice and children were allowed to choose one snack and one prize from the treasure box. Prizes included in the box were stickers, diaries, coloring books, action figurines, toy airplanes, toy skateboards, and Pokemon cards.

### Design

This study was a pretest-posttest two group experimental design. The pretest and posttests were picture arrangement tasks in which the children were given cut outs from a comic strip. The cut outs were given to the children out of order and the children were instructed to put the pictures back together to make a coherent story. The children in the experimental group completed three picture arrangement tasks and one LEGO® frog construction task. The second picture arrangement task was a joint problem solving task in which the children were scaffolded by their mothers. The children in the control group completed two picture arrangement tasks and one LEGO® frog construction tasks. These children did not receive maternal scaffolding during any of the problem-solving tasks.

### Tasks and Measures

#### Picture Arrangement Task

The picture-arrangement task (Salonen, Lepola, & Vauras, 2007) required the children to arrange laminated comic strip pictures out of sequence

into a coherent story. Children were also provided the comic book to help them put the comic back together. The comic strips used were *It's a Dog's Life, Snoopy* (2001) and *Peanuts 2000* (2000). The task was introduced with the following instructions: "Here are some comic strip pictures that were cut out. Put the pictures in the right order so we can read the story again." Children in the experimental group were given the Picture Arrangement Task three times and children in the control group were given the Picture Arrangement Task twice—each time with a different scenario from the comic. On the first occasion, children in both groups were given the picture arrangement task as a pre-test. For this initial task, children were given 7 pictures that they had to put in order to create a coherent story and the comic book to refer to while putting the pictures into the correct order. Four of the comic strip pages the children were given contained words giving the children insight into what the scene in the comic was about. In this particular scene, Charlie Brown and Linus were checking Snoopy's and Woodstocks' groundskeeping work on the baseball field. On the second occasion, mothers of children in the experimental group were instructed to assist their child in putting the comic strip back together so that it makes a coherent story. During this task, the mother's scaffolding behaviors were assessed using the coding system used by Stright, Neitzel, and Herr (2009) discussed below. The second administration of this task for children in the control group required them to complete the task individually and served as both the near transfer condition

and the posttest. During this task, both the experimental and the control groups were given 8 pictures that they had to organize to create a coherent story along with the comic book to refer to. The children in the control group were encouraged to try to complete the task without looking at the book and were told that if the task was too difficult, they could ask for the book. In this scene of the comic, Linus goes with Charlie Brown to return a Christmas gift he bought for the Little Red-Haired girl. Charlie Brown and Linus find out that the sales clerk is the Little Red-Haired girl's mom. Charlie Brown becomes nervous about returning the gift, but Linus helps him out by complimenting the sales clerk. Charlie Brown is then allowed to return the gift. Lastly, children in the experimental group were given a third Picture Arrangement Task that required them to complete the task individually and served as both the near transfer condition and the posttest. During this task, the children in the experimental group were given 12 pictures that they had to organize to create a coherent story and the comic book to refer to. In this scene of the comic, Charlie Brown finds a melting snowman and asks Snoopy to dial 911. Snoopy runs back to the house and realize he doesn't know which number on the phone is a 9. He then runs back out to Charlie Brown and asks him what a 9 looks like. After Charlie Brown tells him, he runs back in the house to call. When he comes back out, the snowman is melted and Charlie Brown says that it's too late and for Snoopy to cancel the call. Task performance on the picture-arrangement tasks was determined by the number of times the child

put a cutout of the comic strip in the wrong sequence (i.e., high numbers indicated poorer performance). On the near transfer task, use of self-regulation was also be assessed. Specifically, observers coded the use of self praise or self-talk, checking work, and correcting mistakes.

### LEGO® Frog Construction Task

This task requires the child to use a set of LEGO® bricks to build a 32-piece frog that looks the same as the model frog they were given. The children were also provided the instruction manual to follow. The LEGO® Construction Task resembled the Picture Arrangement Task in requiring the child to arrange pieces in a coherent manner and in the need to conform to a particular sequence in order to achieve success in assembling the pieces. In addition, for both tasks, there was only one correct solution and that solution was constrained by the materials and goals of the task. The LEGO® Construction Task followed the last administration of the Picture Arrangement Task and was used to examine if there was an occurrence of far transfer of the strategies the children in the experimental group learned and used with their mothers, and the strategies the children in the control group used. The children were given a total of 46 LEGO® pieces (14 LEGO® pieces were distraction pieces), a pre-built model and the instruction manual to aid them in the construction process. Task performance on the LEGO® construction task was determined by the number of LEGO® pieces placed incorrectly while constructing the frog (i.e., high numbers indicated poorer performance). Also,

any distraction pieces used to construct the frog counted against them. As with the Picture Arrangement Task, children's use of self-regulation strategies were also assessed.

### Scaffolding Assessment

Maternal scaffolding during the second administration of the Picture Arrangement Task for the experimental group was coded based on Stright, Herr, and Neitzel's (2009) coding system. Mothers were rated on three aspects of scaffolding: cognitive support, directiveness, and praise and criticism. A rating was given for cognitive support based on the extent to which the mother gave enough information in small steps and at the child's level for the child to complete the task. A 5 was given if the guidance given was complete and stated in steps. A 3 was given if the mother's guidance was contradictory, partially complete, and sometimes given in steps. A 1 was given if the mother's guidance was continuously incomplete and was not given in steps. Directiveness was rated on a scale from 1 to 5 based on whether the mother only stated how the task should be completed, controlled the child's actions, or completed the task for the child instead of supporting the child's involvement. A 5 was given if the mother used hints and questions to encourage the child to actively participate in completing the task instead of simply telling the child what to do. A 3 was given if the mother only stated how the task should be completed. A 1 was given if the mother told the child what to do or completed the task for the child instead of encouraging the child's

active participation. Ratings were given for the amount of praise and the amount of criticism mothers gave their children during the scaffolding interaction. A 1 was given if mothers gave no praise or criticism, a 2 was given if one instance of praise or criticism occurs, and a 3 was given if there were 2 or more occurrences of praise or criticism.

### Self-Regulation Assessment

Children's self-regulation during the administration of each Picture Arrangement Task and the LEGO® Frog Construction Task was coded based on Neitzel and Stright's (2003) coding system. Each child was assessed on three aspects of self-regulation: metacognitive talk, monitoring progress, and task persistence. Assessment of metacognitive talk was based on a frequency count of the number of instances when the child spoke about their own thinking, which included discussing how they solved or approached the problem or making statements about their performance. Assessment of monitoring was based on a frequency count of the number of instances when the child checked their work, noticed errors, and corrected their work on each independent problem-solving task as well as on the joint problem-solving task for children in the experimental group. A rating was given for task persistence based on the extent to which the child maintained effort and interest during each independent task. A 3 was given if the child sustained effort and remained interested in the task during the majority of each independent

problem-solving task. A 1 was given if the child is distracted or disinterested during the majority of each independent task.

#### Children's Behavior Questionnaire—Very Short Form

The Children's Behavior Questionnaire—Very Short Form (CBQ—Very Short Form) (Putnam & Rothbart, 2006) is a measure of child temperament as reported by the mother (see Appendix K). The measure is appropriate for children aged 3 to 7 and consists of 36 items assessing individual differences on 3 broad temperament scales. The temperament scales are surgency/extraversion, negative affectivity, and effortful control. The surgency/extraversion scale consists of items related to impulsivity, high intensity pleasure, and activity level. The negative affectivity scale consists of items that measure sadness, fear, anger/frustration, and discomfort. The effortful control scale consists of items related to inhibitory control, attentional control, low intensity pleasure, and perceptual sensitivity. Mothers will rate their child on each item using a 7-point Likert scale ranging from 1 (extremely untrue of your child) to 7 (extremely true of your child). To score the CBQ, items related to each temperament scale are grouped according to the scoring sheet and averaged to produce 3 mean scores. Certain items are reversed coded as indicated by the scoring sheet. Reliability for surgency/extraversion, negative affectivity, and effortful control are .75, .72, and .74, respectively.

### The Parental Modernity Scale

The Parental Modernity Scale (PMS) (Schaefer & Edgerton, 1985) was used to measure maternal beliefs about child rearing and education (see Appendix L). The Parental Modernity Scale is a 30-item Likert-scale questionnaire that produces two subscores: Progressive, Democratic and Traditional, Authoritarian. The Progressive, Democratic subscale consists of 8 items that demonstrates the beliefs that children are active learners, are individuals and should be treated as such, and should be allowed to share their own ideas (e.g., “It’s all right for my child to disagree with me”). The Traditional, Authoritarian subscale consists of 22 items and demonstrates the belief that children should follow their parents’ commands instead of being autonomous (e.g., “The most important thing to teach children is absolute obedience to parents”). Mothers stated whether they agreed or disagreed with the items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Traditional, Authoritarian subscale produced a total raw score that ranges from 22 to 110. The Progressive, Democratic subscale produces a total raw score that ranges from 8 to 40. Reliability for this measure is .84.

### Rank Order of Parental Values

Schaefer and Edgerton’s (1985) revision of Kohn’s (1977) Rank Order of Parental Values was used to measure maternal values regarding child rearing and education (see Appendix M). The Rank order of Parental Values

consists of rank ordering self-directing, conforming, and social values in children. For the purposes of this study, the social value items were not used since it does not relate to what was examined in this study. An example of the self-directing values is “to think for him/herself” and “to be curious about many things”. The conforming values include “to obey parents and teachers” and “to have good manners”. The rank order of Parental Values consisted of 15 items in which 6 items were related to self-directing behaviors, another 6 items were related to conforming behaviors, and the last 3 items described social behaviors, which were not scored. The items were presented in three sets of five: 2 self-directing, 2 conforming, and 1 social item. Mothers ranked each set of items from 1 to 5 with a 1 indicating highly valued. A score was given to the mothers’ rank of each item. Any item ranked first was given a score of 5 and any item ranked last was given a score of 1. The sum of scores for the self-directing, conforming, and social items produce raw scores for each of the value scales. Both the self-directing and conforming scales produce raw scores that range from 9 to 27. The reliability for the conforming values is .79 and the reliability for the self-directing values is .64.

### Procedure

This study was a pre-test post-test experimental group design that took approximately 30 minutes and was conducted at the elementary school in which the participants were enrolled. Specifically, the study took place in the library of the elementary school. Prior to the start of the study, children were

randomly assigned to the experimental or control group. A consent form was sent home to the parents of the children, and was required to be signed and returned to the researcher. If parents received a blue consent form, then they were randomly selected to participate in the study with their child. If a white consent form was sent home with the child, then the child was randomly selected to participate in the study. A sign up sheet was made available for mothers to sign up to come to the school to complete the problem-solving task with their child along with the three questionnaires. When mothers in the experimental group arrived at their selected time to participate in the study, they were given a demographics questionnaire to fill out. Children in both groups were read a verbal assent statement. Next, all children were given a pre-test at Time 1 involving the first picture arrangement task. At Time 2, the control group completed a second Picture Arrangement Task that served as both a measure of the near transfer and as the posttest. This task was used to examine if the children in the control group used the same strategies they used in the first Picture Arrangement Task and if they changed any strategies that were not successful on the first task. During the Picture Arrangement Tasks, two observers noted and tallied the number of times the child placed a cutout of the comic strip in the wrong sequence. The experimental group participated in the scaffolding interaction with the mother involving the second Picture Arrangement Task. The mother and child were taken into the library in which there was a researcher available to answer any questions or provide

assistance as well as two observers. Mother and child worked together on the Picture Arrangement Task. Mothers were instructed to assist their child in putting the comic strip back together so that it is a coherent story. During this task, the mother's scaffolding behaviors were assessed using the coding system used by Stright, Neitzel, and Herr (2009). Two observers noted and tallied scaffolding behaviors, and at the end of the task the observers coded the mother's scaffolding behavior. Observers also noted and tallied the number of times the child placed a cutout of the comic strip in the wrong sequence. Once the child completed this task, the mother was instructed to sit at a table across the room to fill out the CBQ, the Parental Modernity Scale, and the Rank Order of Parental Values Measure. While mothers filled out the questionnaires at the other table, children in the experimental group were given a third Picture Arrangement task to work on independently, which was the post-test and the near transfer task. During this task, the child's self-regulation was assessed using the coding system used by Neitzel and Stright (2003). Children in the control group also had their self-regulation assessed using this coding system during the second Picture Arrangement Task. This task was used to examine if there is an occurrence of near transfer of the strategies the children in the experimental group learned and used with their mothers during the scaffolding interaction. The child's performance on this task was scored in the same manner as the first picture arrangement task. Once the children in each group completed the last Picture Arrangement Task,

they were given the LEGO® frog construction task to work on independently. The children were instructed to build a frog that looks the same as the model frog they were given. They were also given the instruction manual to follow. During this task, each child's self-regulation was assessed using the same coding system as the one in the picture arrangement task. This task was used to examine if there was an occurrence of far transfer of the strategies the children in the experimental group learned and used with their mothers, and a far transfer of the strategies the children in the control group used during the Picture Arrangement Task. Their task performance was scored similarly to the picture arrangement task. For this task, the observers noted and tallied the number of LEGO® pieces the child placed incorrectly during the frog construction. Upon completion of each problem solving task and questionnaire, mothers and children in both groups were thanked, debriefed, and given their incentives for participating in the study.

The observers who were responsible for rating and evaluating children's behavior and mothers' scaffolding were trained prior to the study. Training began with a powerpoint presentation describing the rating scale in detail and providing examples of each rating. Once the observers were familiar with the rating scales, they watched and rated four videos of mothers and their children working together on a problem-solving task. At the end of each video, observers compared the ratings they gave and discussed why they gave that rating. After each discussion, correlations were computed on the observers'

scores. Once all of the observers' scores reached a correlation of .6 or higher, the observers were determined to be ready to begin data collection.

## CHAPTER THREE

### RESULTS

Each of the scaffolding and child problem solving variables involved observations from two individual observers. Inter-rater reliabilities were consistently high across these variables ranging from  $r = .87$  to  $r = .99$ . Consequently, the scores for the two observers were combined for each variable.

As an initial analysis, possible relationships between the demographic variables in the study and key variables in the hypotheses were explored. Results indicated that most of the demographics were unrelated to the variables of the study; however, there were several exceptions. There was a positive correlation between children's age and the Children's Behavior Questionnaire Effortful Control Scale score,  $r(8) = .67$ ,  $p < .05$ . Education level and the Parental Modernity Scale Overall Traditional score were positively correlated,  $r(8) = .62$ ,  $p < .05$ . Family size was positively correlated with maternal cognitive support,  $r(8) = .63$ ,  $p < .05$ . Both maternal age and children's age were positively correlated with the self-regulation strategy monitoring progress on the LEGO® frog construction task,  $r(8) = .73$ ,  $p < .05$ , and  $r(8) = .68$ ,  $p < .05$ , respectively. Lastly, income level was negatively correlated with children's task persistence on the LEGO® frog construction task,  $r(8) = -.67$ ,  $p < .05$ . Several of these significant relationships are consistent with the literature. Effortful control as a dimension of temperament

is greater in older children. Similarly, older children tend to have higher self-regulation than younger children. Parents with higher educational levels are often less traditional in their beliefs. Other relationships are less obvious. The positive relationship between family size and effective scaffolding is particularly interesting and may indicate that mothers' experience across multiple children leads to improved scaffolding skills. One relationship also poses a viable alternative explanation of a hypothesized relation. Since both child age and maternal age were related to children's use of monitoring on the LEGO® Task, it is possible that the predicted relationship between quality of scaffolding and children's self-regulation in problem solving is due to the fact that it is easier to scaffold older children, older children have better self-regulation, and older mothers have more experience with scaffolding their child, which leads to improved scaffolding skills.

The first two hypotheses concerned mothers' beliefs and values in relation to their scaffolding. Specifically, mothers who hold authoritative beliefs and value their children's autonomy will use optimal scaffolding. In contrast, mothers who hold authoritarian beliefs and value their children's conformity will use less optimal scaffolding. These hypotheses were assessed by way of a series of correlations between the quality of maternal scaffolding measures and the individual beliefs and values measures. In addition to the individual quality of maternal scaffolding measures, a maternal scaffolding composite was created by combining each measure of maternal scaffolding (i.e.,

Maternal Cognitive Support, Maternal Directiveness, Maternal Praise, and Maternal Criticism). Maternal criticism was reversed coded before being added to the other maternal scaffolding measures to create the maternal scaffolding composite. Rating of Parental Values questionnaire data from one mother was eliminated because she did not complete the questionnaire correctly according to the instructions. See Table 1 for results. As can be seen from the table, there was a positive correlation between Maternal Cognitive Support and mothers' Parental Modernity Scale Progressive Score. The table also indicates negative correlations between Maternal Cognitive Support and mothers' Parental Modernity Scale Traditional Score, and between Maternal Directiveness and mothers' Parental Modernity Scale Traditional Score. These results provide support for the first two hypotheses indicating that maternal beliefs are related to quality of maternal scaffolding; however, these results did not provide support for the relationship between maternal values and scaffolding. In regards to the relationship between maternal scaffolding and maternal values, as can be seen in Table 1, the effect size between the ROPV Conformity score and maternal cognitive support and directiveness was moderate. This correlation was positive indicating that mothers who valued their children's conformity used more cognitive support and directiveness during the joint problem-solving task.

The third hypothesis concerned the role of children's temperament in facilitating or hindering mothers' use of scaffolding. Specifically, mothers of

children with easy temperaments were expected to use optimal scaffolding and mothers of children with difficult temperaments were expected to use poor scaffolding. See Table 1 for correlations. Although none of the correlations between children's temperament and quality of maternal scaffolding were significant, each of the temperament scales yielded modest negative and positive correlations that did not support this hypothesis. The negative correlation between Maternal Criticism and Surgency indicates that mothers are more critical when their children are less impulsive and their activity level is lower; however, mothers are less critical when their children are impulsive and have high activity levels. The negative correlation between Maternal Praise and the Children's Behavior Questionnaire Effortful Control Score indicated that mothers give less praise and encouragement when their children have more self-control and, consequently, are able to focus their attention on the problem-solving task; however, mothers give more praise and encouragement when children show less self-control and struggle with focusing on the task at hand. The negative correlation between the Scaffolding Composite and the Children's Behavior Questionnaire Effortful Control Score indicates that mothers engage in less optimal scaffolding when their children demonstrate more self-control and are able to attend to the problem-solving task they are working on; however, mothers use more optimal scaffolding when their children show less self-control and are unable to focus on the problem-solving task. The positive correlation between Maternal Praise and

the Children's Behavior Questionnaire Negative Affect Score shows that mothers praise and encourage their children more when their children display fear, discomfort, and sadness when working on a joint problem-solving task. Mothers praise and encourage their children less when their children show more confidence, are comfortable, and happy during a scaffolded interaction.

The fourth and fifth hypotheses stated that quality of maternal scaffolding would be related to children's problem solving performance and self-regulation, respectively. These hypotheses were examined with a series of correlations (See Table 2). Task performance data from one experimental-group participant during the scaffolded interaction was not included since the mother completed the task for the child and the child did not participate. Post-test task persistence correlations were not included in Table 2 since there was no variability in the task persistence ratings. As seen from Table 2, there were a few moderate sized correlations that support hypothesis four. Mothers' critical comments during the scaffolded interaction were related to children's poor performance on the joint problem-solving task. Thus, although effect sizes were small, both maternal cognitive support and directiveness were positively correlated with children's performance on the post-test. This same relationship, however, was not found between maternal scaffolding and performance on the LEGO® frog construction task. These results suggest that there was an occurrence of near transfer, but not far transfer of problem-solving strategies. Regarding hypothesis five, and as

evident from Table 2, there were a few moderate correlations. There were also a few large correlations that reached statistical significance; however, these results did not support the hypothesis. Mothers' use of optimal cognitive support and directiveness were shown to be related to children's use of monitoring progress on the post-test. Maternal praise was negatively correlated with children's metacognitive talk during the LEGO® frog construction task, which is the opposite of what was hypothesized. This result indicates that children engaged in *less* metacognitive talk during the LEGO® frog construction task when their mothers praised and encouraged them during the scaffolded interaction. In addition, maternal criticism was positively correlated with metacognitive talk during the post-test and the LEGO® construction task indicating that mothers' critical comments during maternal scaffolding were associated with *more* (not less) metacognitive talk during the post-test and the LEGO® frog construction task. Lastly, the scaffolding composite was negatively correlated with metacognitive talk during both the post-test and the LEGO® frog construction task. Specifically, mothers who provided optimal scaffolding to their children during the joint problem-solving task, had children who engaged in *less* metacognitive talk during the LEGO® frog construction task. Mothers who poorly scaffolded their children during the joint problem-solving task, had children who used *more* metacognitive talk during the LEGO® frog construction task.

As an additional examination of the fourth and fifth hypotheses that quality of scaffolding would be related to children's performance and use of self-regulation strategies, two frequency tables or crosstabulations were constructed. For task performance, children were assigned to a low or high performance group by using a median split of their performance score. Likewise, for self-regulation, children were assigned to a low or high regulation group by using a median split of the distribution of self-regulation scores. Children were also assigned to a low or high maternal scaffolding group using a median split for the distribution of maternal scaffolding scores. The results appear in Tables 3 and 4, respectively. The expected pattern for maternal scaffolding and task performance, given the hypothesis, would be for most children to fall along the diagonal such that low scaffolding is associated with low performance and high scaffolding is associated with high performance. As can be seen in Table 3, this pattern was not found. The expected pattern for maternal scaffolding and children's self-regulation strategies, given the hypothesis, would be for most children to fall along the diagonal such that low scaffolding is associated with low self-regulation and high scaffolding is associated with high self-regulation. As can be seen in Table 4, this pattern is more consistent with the results. The chi-square test was not significant for either crosstabulation. However, the extremely low sample size makes interpretation of the chi-square statistic largely impossible.

In order to test the sixth hypothesis that children receiving scaffolding from their mother would demonstrate better problem solving performance and self-regulation than children in the control group, a series of Analyses of Variance was conducted. The experimental and control groups were compared in terms of pretest and posttest performance, self-regulation, and metacognitive talk during the problem-solving tasks. For the purpose of this analysis, composite scores were created. The posttest and LEGO® frog construction task performance scores were combined into a single performance measure. The monitoring and persistence scores for both the posttest and the LEGO® frog construction task were combined into a single self-regulation index. Finally, the metacognitive talk scores across the posttest and the LEGO® frog construction task were combined into a single index of metacognitive talk. The means and standard deviations for these comparisons appear in Table 5. Results indicated that the experimental group and the control group did not differ significantly on pretest performance,  $F(1, 18) = 2.10, p < .16$ , though the mean performance of the control group is noticeably higher than that of the experimental group (See Table 5). The groups also did not differ on the posttest task performance,  $F(1, 18) < 1.00$ , or in terms of the posttest-pretest change scores,  $F(1, 18) < 1.00$ . The experimental and control groups also did not differ significantly on self-regulation,  $F(1, 18) < 1.00$ , or amount of metacognitive talk,  $F(1, 18) = 1.33, p < .26$ ; however, the mean metacognitive talk of the

experimental group is noticeably higher than that of the control group (See Table 5).

## CHAPTER FOUR

### DISCUSSION

The data from this study adds to the literature on maternal scaffolding and children's problem-solving skills. Specifically, it provides insight into the relationship between maternal scaffolding, maternal beliefs and values, and children's temperament as well as the relationship between certain aspects of maternal scaffolding and children's performance on problem-solving tasks and use of self-regulation strategies.

#### Maternal Scaffolding and Maternal Beliefs and Values

The first two hypotheses were that mothers who held progressive beliefs and valued their children's autonomy would use more optimal scaffolding, and mothers who held more traditional beliefs and valued their children's conformity would use less optimal scaffolding. These hypotheses were partially supported. Mothers who held more progressive beliefs provided more cognitive support, engaged in more contingent shifting, and encouraged and praised their child more during the scaffolded interaction. Mothers who held more traditional beliefs were less cognitively supportive, engaged in less contingent shifting, and provided less motivational support. These results suggest that maternal beliefs may be related to how mothers scaffold their children during a joint problem-solving task. Mothers who hold more progressive, democratic beliefs encourage their children's active participation

in their learning and encourage their children to share their thoughts and ideas; mothers who hold traditional, authoritarian beliefs expect their children to do as they are told instead of expressing their own opinions (Rodriguez & Olswang, 2003). Mothers who are more democratic in their parenting beliefs may encourage their child's participation during a joint problem-solving task by asking questions, breaking the problem down into smaller steps, providing instructions at their child's level, and encouraging their child to complete the task. By taking this approach with their children, these mothers use optimal scaffolding. Mothers who hold traditional, authoritarian beliefs may discourage their child's participation during a scaffolded interaction, may fail to clearly explain how to complete the task or may provide minimal instruction, and may criticize their child when they make a mistake. These strategies lead to poor scaffolding. Keels (2009) also found that mothers who held more progressive parenting beliefs encouraged their children's independence, encouraged and praised their children, and used optimal scaffolding when teaching their children.

In regards to maternal values, it was found that mothers who valued conformity tended to be more cognitively supportive, used more contingent shifting, and provided more praise, though none of these relationships reached significance. The direction of these relationships contradicts the hypotheses and previous research. Previous research has shown that mothers who value their children's independence use more optimal scaffolding and

mothers who value their children's conformity use poor scaffolding (Rogoff, 1990; Grolnick, Price, Beiswenger, & Syacjm 2007; Keels, 2009; Richman & Mandara, 2013). One possibility for the current study's results is that these mothers held progressive beliefs and valued conformity in their children. Keels (2009) found that Hispanic-American and African-American mothers held both progressive beliefs and valued their children's conformity and obedience. This relates to the current study in that the majority of the mothers who participated in the study (7 out of 10) were Hispanic/Latino and African-American. Even though these mothers value their children's conformity, since they hold progressive beliefs, they still may engage in optimal scaffolding when working jointly with their child on a problem-solving task.

#### Maternal Scaffolding and Children's Temperament

The third hypothesis stated that mothers of children with easy temperaments would use optimal scaffolding and mothers of children with difficult temperaments would use poor scaffolding. The findings did not support this hypothesis. Although not statistically significant, it was found that mothers gave less praise and used poorer scaffolding when their children demonstrated more self-control and were able to focus on the task at hand, and mothers gave more praise and used optimal scaffolding when their children showed less self-control and found it difficult to focus on the problem-solving task. Mothers also provided more praise and encouragement when their children showed fear, discomfort, and sadness during the joint

problem-solving task; however, mothers gave less praise and encouragement when their children demonstrated more confidence and appeared to be happy during the scaffolded interaction. Previous research has typically found that mothers tend to use more optimal scaffolding when their children have easy temperaments and less optimal scaffolding when their children have difficult temperaments (Gauvain & Fagot, 1995; Neitzel & Stright, 2004; Eisenberg, Vidmar, Spinrad, Eggum, Edwards, Gaertner, & Kupfer 2010). However, in a second study conducted by Gauvain and Fagot (1995), it was found that mothers with children with difficult temperaments provided more cognitive support and directiveness, but gave less praise and encouragement. This outcome is closer to the findings of the present study. Neitzel and Stright (2004) also found that parents who were more educated provided instructions at their child's level, encouraged their child's participation in the task, and gave more praise than less educated mothers. The present study was conducted at a school in a low socioeconomic status area; however, half of the mothers who participated in this study indicated that they received some college education or higher (3 mothers attended some college, 1 mother had an associate's degree, and 1 mother had a graduate degree). It is possible that when mothers receive postsecondary schooling, they are better able to provide more instructional guidance at their child's level of understanding, ask questions and give hints to encourage their child's participation, and are more encouraging when scaffolding their child.

## Maternal Scaffolding and Children's Task Performance and Self-Regulation

Hypotheses four and five stated that children who received optimal scaffolding during the joint problem-solving task would have higher performance and would use more of the self-regulation strategies during the post-test and the LEGO® frog construction tasks. Also, children who received poor scaffolding during the scaffolding interaction would have lower performance and would use fewer self-regulation strategies during the independent problem-solving tasks. The findings provided some support for the hypotheses four and five. Specifically, when mothers provided more cognitive support, directiveness, and praise during the joint problem-solving task, their children had higher performance and used more progress monitoring during the posttest. The correlation coefficients were moderate, though not significant. This finding is consistent with previous research conducted on maternal scaffolding and children's self-regulation strategies (Stright et al., 2001; Neitzel & Stright, 2003). While conducting the observations during the joint problem-solving task, it was observed that when children made a mistake on the task, mothers who engaged in optimal scaffolding began to ask questions and give hints such as, "Are you sure that's where it goes? Does that look right to you? Maybe we should read it to see if the story makes sense." It is possible that these questions and hints during the joint problem-solving task served as a model of how the child should check their work, notice errors, and correct their mistakes, which they then carried

over to the post-test. When mothers break the problem down into small steps at their child's level, use hints and questions to encourage the child's active participation, and encourage their child, it is possible that these scaffolding strategies relieve some cognitive strain for the child as well as help the child to stay focused on the task at hand. Since the mother is helping relieve cognitive strain and helping the child attend to the task, the child is better able to see how the mother monitored the child's progress and was able to carry that self-regulation strategy over to the post-test.

Other findings from the current study contradicted the fifth hypotheses. Specifically, it was found that when mothers used overall optimal scaffolding, their children used less metacognitive talk during both the post-test and the LEGO® frog construction task. When mothers used poor scaffolding, their children engaged in more metacognitive talk during the independent problem-solving tasks. These findings contradict previous research (Stright et al., 2001; Neitzel & Stright, 2003). One possible explanation for the current study's conflicting findings is that only one aspect of metacognitive talk, i.e., children making comments about their task performance, was assessed in this study. In the research conducted by Stright and colleagues (2001, 2003), metacognitive talk consisted of children discussing how they reached a certain answer, why they approached a problem in a particular way, as well as children's evaluative remarks about their task performance. Another possible explanation is that children of mothers who use better scaffolding are further

along in the process of internalizing means of self-direction and guidance. Such children would need to rely less on metacognitive-talk during the task since they are presumably using verbal thought to guide their behavior. That is, they are better able to self-regulate and no longer have a need for speaking out loud about their performance. Lastly, it is possible that the depth of the cognitive support that mothers provide may impact their children's metacognitive talk. Stright and colleagues (2001) found that mothers who provided the child with information on how to prepare for the task, how the task was structured, the goal of the task, possible challenges the child may encounter when working on the task, which aspects of the task to closely attend to, which strategies to use, and how and why to use those strategies, had children who engaged in more metacognitive talk during an independent problem-solving task. The mothers in the current study only used optimal scaffolding by breaking the problem down into small steps at the child's level and using hints and questions to guide the child. It is possible that for children to use metacognitive talk, their parents need to provide thorough instructions on how to complete the task, what to expect, and what strategies to use.

#### Limitations and Future Research

One limitation of this study is the sample size. Previous studies that have examined maternal scaffolding and children's problem solving typically had 60-70 mother-child dyads (Neitzel & Stright, 2003; Neitzel & Stright, 2004). In comparison to previous research, this sample was much smaller

than sample sizes used in previous research, which indicates that there was less statistical power and the results should be interpreted with caution. Future research should include a much larger sample size. Another limitation of this study is that the sample did not represent the general population. The majority of the participants in the study were of Hispanic/Latino or African American descent, and had a low income level. Future research should use a diverse sample to better represent the general population. One last limitation of this study was that only one aspect of metacognitive talk was assessed during this study. Future research should examine each aspect of children's metacognitive talk.

### Conclusions

Although interpretations and conclusions to be made are limited due to the small sample size and the correlational statistics used, some of the findings are in line with previous research and further contribute to the literature on maternal scaffolding and children's problem-solving and use of self-regulation strategies. Since maternal beliefs about parenting and educating children were shown to be related to the type of scaffolding used, parent education programs should train parents on developmentally appropriate practice in raising their children and how their children learn best. Given that Common Core standards require children to develop and use reasoning and problem solving skills in order to be successful in their academics (Brown & Kappes, 2012), the type of scaffolding children receive

can either help them develop or hinder their development of problem-solving skills and self-regulation strategies. By monitoring their progress, they are able to catch and correct any mistakes they make, which will ensure their successful completion of the problem. Stright and colleagues (2001) found that mothers who engaged in cognitive support, directiveness, and praise when scaffolding their children at home had children who monitored their progress when working on various assignments at school. To ensure that children receive optimal scaffolding, parent education or intervention programs should train and teach parents on how to properly scaffold their child when working one-on-one with them at home. By educating and training parents in how children learn and develop, teaching parents developmentally appropriate practice, and teaching parents how to optimally scaffold their children, these parent education or intervention programs can provide parents with the tools they need to ensure their children's success in school.

APPENDIX A  
CHILD ASSENT FORM (SCAFFOLDING GROUP)

## **Child Assent Form (Scaffolding Group)**

My name is Andria Clausell and I am a student at California State University in San Bernardino. You are being asked to be part of a research project that I am conducting on how children in the first grade play a comic strip game and a LEGO® game. Your mom will be part of the project too. Let me explain more about what we will be doing.

- First of all, I'm going to show you a new kind of comic strip game that you will play by yourself.
- Then, when you are finished, you will play the same game for a second time with your mom. Finally, I want to show you a LEGO® game and have you try that for a few minutes.
- When your mom isn't playing with you, she will be filling out a survey in the room next door.
- The project will take about 30 minutes to complete.
- The games we have for you to play are not a test of any kind. In fact, there is no right or wrong way to play these games!
- We are going to watch you and take notes while you are playing the games so that we can learn from watching you show what a really good way to play the game is.
- Before we start, I want you to know that you are free to stop playing these games at any time after you have begun. Just let us know at any time if you wish to stop.
- Do you have any questions for me? Would you like to play the games?

Developed by Andria Clausell

APPENDIX B  
CHILD ASSENT FORM (CONTROL GROUP)

## **Child Assent Form (Control Group)**

My name is Andria Clausell and I am a student at California State University in San Bernardino. You are being asked to be part of a research project that I am conducting on how children in the first grade play a comic strip game and a LEGO® game. Let me explain more about what we will be doing.

- First of all, I'm going to show you a new kind of comic strip game that you will play by yourself.
- Then, when you are finished, you will play the same game for a second time by yourself again. Finally, I want to show you a LEGO® game and have you try that for a few minutes.
- The project will take about 30 minutes to complete.
- The games we have for you to play are not a test of any kind. In fact, there is no right or wrong way to play these games!
- We are going to watch you and take notes while you are playing the games so that we can learn from watching you show what a really good way to play the game is.
- Before we start, I want you to know that you are free to stop playing these games at any time after you have begun. Just let us know at any time if you wish to stop.
- Do you have any questions for me? Would you like to play the games?

Developed by Andria Clausell

APPENDIX C  
INFORMED CONSENT FORM

## **Informed Consent Form**

Your child has been invited to participate in a study designed to explore children's problem-solving skills. The study is being conducted by Andria Clausell, a Child Development graduate student at California State University San Bernardino (CSUSB), and Dr. Robert Ricco, Professor of Psychology at the University. This study has been approved by the Institutional Review Board of CSUSB. The University requires that you give consent in order for your child to participate.

In this study, all children who have parental permission to participate will be randomly assigned to one of two groups. The children in Group 1 will participate in a play session at school where they will work on several problem-solving tasks. Specifically, they will put pictures together to tell a story and they will build things with LEGO® pieces. The children in Group 2 will also participate in a play session involving some of these same problem-solving tasks. This play session should last about 20 minutes. Each session will take place after school. Each child in Group 2 will participate in a second session that will include the child's mother. In this session, mother and child will work together on a problem-solving task. Once mother and child complete the joint task, the mother will be asked to fill out three questionnaires and the child will work on two more problem-solving tasks independently. Two of the questionnaires will ask about the mother's parental beliefs and values, and the other will ask the mother to describe her child's temperament. This second session for Group 2 children (and their mothers) will take about 30 minutes and will also take place at the school. Children in Group 1 will not come back for a second session.

If you have received a blue consent form, this means that your child has been assigned to Group 2 and you are being asked to consent to your child's participation and to your own participation in the study. We will have a number

of possible days/times for you to choose from in scheduling the play session with your child. These include times during school hours and after school.

If you have a white consent form, this means that your child has been assigned to Group 1 and you are being asked to consent to your child's participation only.

Be assured that any information you or your child provide is completely anonymous. At no time will your name or your child's name be reported along with the observations made while completing the problem-solving tasks. All data will be reported as means or averages across an entire group of individuals. We wish also to stress that this is not an assessment of you or your child in any sense. None of the measures employed in this study allow any conclusions to be drawn about specific individuals. All data we are collecting will be kept for two years and will then be destroyed. In March 2016, you may receive a report of the general results by contacting Andria Clausell at [clausela@coyote.csusb.edu](mailto:clausela@coyote.csusb.edu) or Dr. Ricco at 909-537-5485 or [rricco@csusb.edu](mailto:rricco@csusb.edu). Please understand that your child's participation and your participation (if your child is in Group 2) are completely voluntary and that each of you is free to withdraw at any time during this study. If you have any questions concerning research participants' rights, please contact Andria Clausell or Dr. Ricco. There are no foreseeable risks associated with participation in this study and no obvious benefits to your child. On the other hand, the findings of the study may prove beneficial to researchers studying children's development. On the next page, you can indicate your consent to have your child participate in the study. Please respond only to the statement that fits the color of this form.

If you have a BLUE CONSENT FORM, and you consent to both your child's participation and your participation, please respond to the following:

By signing below, I acknowledge that I have been informed of, and that I understand what will be asked of myself and my child, and I freely consent to

my own participation and to that of my child. I also acknowledge that I am at least 18 years of age.

Your Signature:\_\_\_\_\_ Today's Date:\_\_\_\_\_ Child's Name:\_\_\_\_\_ Participant Code:\_\_\_\_\_

If you have a WHITE CONSENT FORM, and you consent to your child's participation, please respond to the following:

By signing below, I acknowledge that I have been informed of, and that I understand what will be asked of my child, and I freely consent to my child's participation. I also acknowledge that I am at least 18 years of age.

Your Signature:\_\_\_\_\_ Today's Date:\_\_\_\_\_ Child's Name:\_\_\_\_\_ Participant Code:\_\_\_\_\_

APPENDIX D  
RECRUITMENT SCRIPT

## **Recruitment Script**

My name is Andria Clausell and I am a student at California State University in San Bernardino. I am here today to see if any of you would be interested in playing a comic strip game and a LEGO® game. I have the games with me and I can show them to you. Here they are. These games are part of a project I am doing for my school – California State University. I am going to send a letter home to your mom or dad asking their permission for you to play the games with me. If they say “yes”, then one day after school you will be able to play the games. We will play them in another room at the school. For some of you, we will play the games twice. The second time, your mom will play with you. What do you think of the games? Do they look fun? If you would like to play these games, tell your mom or dad so that they can give their permission for you to play them at school.

Developed by Andria Clausell

APPENDIX E  
RECRUITMENT LETTER (EXPERIMENTAL GROUP)

## **Recruitment Letter (Experimental Group)**

Dear Parent or Guardian,

My name is Andria Clausell and I am a graduate student in the Child Development M. A. program at CSUSB. I am writing to invite you and your child to participate in a research study being conducted by myself and Dr. Robert Ricco, a professor in the Child Development program. This study is looking at how mothers interact with their children when playing a game with their child. The study will be done at your child's school in one of the rooms made available by the Emmerton staff. For this study, your child will play several games during two sessions. During each session, two researchers will observe how your child plays the games. Both sessions will take approximately 30 minutes. Each session will take place after school. This will ensure that your child is not missing instructional time in the classroom. If your child is in CAPS, they will complete the first session during CAPS. If they are not in CAPS, you can sign them up for a date and time that works best for you. We would like you to join your child for the second session and to play one of the games with your child. We will have several dates and times that you can choose from in scheduling this second session. After you play one game with your child, you will fill out three surveys. Two of the three surveys will be about your parental beliefs and values, and the third survey will be about your child's personality. Your participation in this study should take approximately 30 minutes. Any information you and your child provide will be completely anonymous. If you and your child are interested in participating in this study, please sign the consent form attached to this letter and return it to the Emmerton Elementary office. A sign up sheet will also be made available to you in the Emmerton Elementary office to choose a date and time for you and your child to come in to participate in the study.

APPENDIX F  
RECRUITMENT LETTER (CONTROL GROUP)

### **Recruitment Letter (Control Group)**

Dear Parent or Guardian,

My name is Andria Clausell and I am a graduate student in the Child Development M. A. program at CSUSB. I am writing to invite your child to participate in a research study being conducted by myself and Dr. Robert Ricco, a professor in the Child Development program. This study is looking at how children play games. The study will be done at your child's school in one of the rooms made available by the Emmerton staff. For this study, your child will play several games, which will take approximately 30 minutes. While your child plays the games, two researchers will observe how your child plays the games. Any information that your child provides will be completely anonymous. Your child will receive a prize for their participation in this study. Each session will take place after school. This will ensure that your child is not missing instructional time in the classroom. If your child is interested in participating in this study, please sign the consent form attached to this letter and return it to the Emmerton Elementary office. If your child is not in the CAPS program, a sign up sheet will be made available for you in the office to choose a date and time that works best for you to bring your child to Emmerton to participate in the study.

APPENDIX G  
DEMOGRAPHICS QUESTIONNAIRE

## Demographics Questionnaire

1. What is your age? \_\_\_\_\_
2. What is your child's age (i.e., the child participating in this study)?  
\_\_\_\_\_
3. What is your child's gender (i.e., the child participating in this study)?  
 Male  Female
4. What is your marital status?  
 Single (never married)  
 Married  
 In committed relationship  
 Widowed  
 Divorced  
 Separated
5. What is your income level?  
 Less than \$20,000     \$20,000-\$34,999     \$35,000-\$49,999  
 \$50,000-\$74,999     \$75,000-\$99,999     \$100,000 or more
6. What is your educational level?  
 Less than a high school diploma  
 High school diploma or GED  
 Some college, no degree  
 AA or other two-year degree  
 Bachelor's degree  
 Graduate degree
7. What is your ethnicity?  
 African-American     American Indian/Alaskan Native  
 Asian/Pacific Islander     Caucasian     Hispanic/Latino  
 Other (Please Specify) \_\_\_\_\_
8. What is your family size (i.e., how many people live in your household)?  
\_\_\_\_\_
9. How many children do you have? \_\_\_\_\_
10. What is the birth order of the child participating in this study (please place a check mark next to your answer)?  
 Firstborn     Second born     Third born    \_\_\_\_\_  
Other (Please specify): \_\_\_\_\_

Developed by Andria Clausell

APPENDIX H  
CHILD DEBRIEFING STATEMENT (SCAFFOLDING GROUP)

### **Child Debriefing Statement (Scaffolding Group)**

Thank you for participating in this project! The games you and your mom played for us will be very helpful in trying to understand how mothers and children play together. With this information, we can come up with some ideas for how mothers and their children can have fun playing games together!

The games you played are not a test, like you might take at school. There are no right or wrong answers to the games. If you have any questions about this project, or if playing these games made you feel bad in any way, please let us know right now. If you think of things you want to ask about later on, just tell your mom and she will tell us so we can answer your questions. Thanks again for your help, we really appreciate it! We'd like to give you a thank you gift for helping us. Make sure you do not leave without it!

APPENDIX I  
CHILD DEBRIEFING STATEMENT (CONTROL GROUP)

### **Child Debriefing Statement (Control Group)**

Thank you for participating in this project! The games you played for us will be very helpful in trying to understand how children solve problems. With this information, we can come up with some ideas for how children can have fun playing games and solving problems!

The games you played are not a test, like you might take at school. There are no right or wrong answers to the games. If you have any questions about this project, or if playing these games made you feel bad in any way, please let us know right now. Thanks again for your help, we really appreciate it! We'd like to give you a thank you gift for helping us. Make sure you do not leave without it!

APPENDIX J  
PARENT DEBRIEFING STATEMENT

## **Parent Debriefing Statement**

Thank you for your participation in this study. The tasks and measures you and your child have just completed are being used to study how mothers teach their children problem solving skills. In particular, we are interested in the strategies mothers with their children, and how parental beliefs and values and children's temperament influence the strategies mothers use.

Please be assured that your name and that of your child will not be attached in any way to your responses to the questionnaires. In this way, your contributions to our research project are completely anonymous. This is guaranteed in accordance with ethical and professional codes set by the CSUSB Institutional Review Board and the American Psychological Association. Also, this has not been an assessment of your child in any sense, nor has this been an assessment of your adequacy as a parent. The focus of this research is on all participants as a group (i.e., all mothers and their children) and not on individuals. The measures used do not permit meaningful conclusions about individuals. Should you be interested in the general findings, the results will be available to you in March 2016. Please contact Andria Clausell at [clausela@coyote.csusb.edu](mailto:clausela@coyote.csusb.edu) or Dr. Ricco at 909-537-5485 or [rricco@csusb.edu](mailto:rricco@csusb.edu) if you are interested in the results or if you have any further questions about your participation. It is unlikely that any psychological harm will result from participation in this study. Thanks for your help and here is a thank you gift for assisting us in this study. Make sure you do not leave without it!

APPENDIX K  
CHILDREN'S BEHAVIOR QUESTIONNAIRE

## Children's Behavior Questionnaire

### Instructions:

Please read carefully before starting: On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction within the past six months. Use the following scale to indicate how well a statement describes your child: 1 for extremely untrue, 2 for quite untrue, 3 for slightly true, 4 for neither true nor untrue, 5 for slightly true, 6 for quite true, and 7 for extremely true. If you cannot answer one of the items because you have never seen the child in that situation, for example, if the statement is about the child's reaction to your singing and you have never sung to your child, then circle NA (not applicable). Please be sure to circle a number or NA for every item.

### My child:

1. Seems always in a big hurry to get from one place to another.
2. Gets quite frustrated when prevented from doing something s/he wants to do.
3. When drawing or coloring in a book, shows strong concentration.
4. Likes going down high slides or other adventurous activities.
5. Is quite upset by a little cut or bruise.
6. Prepares for trips and outings by planning things s/he will need.
7. Often rushes into new situations.
8. Tends to become sad if the family's plans don't work out.
9. Likes being sung to.
10. Seems to be at ease with almost any person.
11. Is afraid of burglars or the "boogie man."
12. Notices it when parents are wearing new clothing.
13. Prefers quiet activities to active games.

14. When angry about something, s/he tends to stay upset for ten minutes or longer.
15. When building or putting something together, becomes very involved in what s/he is doing, and works for long periods.
16. Likes to go high and fast when pushed on a swing.
17. Seems to feel depressed when unable to accomplish some task.
18. Is good at following instructions.
19. Takes a long time in approaching new situations.
20. Hardly ever complains when ill with a cold.
21. Likes the sound of words, such as nursery rhymes.

My child:

22. Is sometimes shy even around people s/he has known a long time.
23. Is very difficult to soothe when s/he has become upset.
24. Is quickly aware of some new item in the living room.
25. Is full of energy, even in the evening.
26. Is not afraid of the dark.
27. Sometimes becomes absorbed in a picture book and looks at it for a long time.
28. Likes rough and rowdy games.
29. Is not very upset at minor cuts or bruises.
30. Approaches places s/he has been told are dangerous slowly and cautiously.
31. Is slow and unhurried in deciding what to do next.
32. Gets angry when s/he can't find something s/he wants to play with.
33. Enjoys gentle rhythmic activities such as rocking or swaying.
34. Sometimes turns away shyly from new acquaintances.
35. Becomes upset when loved relatives or friends are getting ready to leave following a visit.
36. Comments when a parent has changed his/her appearance.

Please check back to make sure you have completed all items by marking a number or "NA". Thank you very much for your help!

Developed by Samuel P Putnam and Mary K Rothbart

APPENDIX L  
PARENTAL MODERNITY SCALE

## Parental Modernity Scale

Here are some statements other parents have made about rearing and educating children. For each one, please circle the number that best indicates how you feel in general, not just about your own child. Circle 1 or strongly disagree, 2 for mildly disagree, 3 for not sure, 4 for mildly disagree, and 5 for strongly agree.

1. Since parents lack the special training in education, they should not question the teacher's teaching methods.
2. Children should be treated the same regardless of differences among them.
3. Children should always obey the teacher.
4. Preparing for the future is more important for a child than enjoying today.
5. Children will not do the right thing unless they must.
6. Children should be allowed to disagree with their parents if they feel their own ideas are better.
7. Children should be kept busy with work and study at home and at school.
8. The major goal of education is to put basic information into the minds of the children.
9. In order to be fair, a teacher must treat all children alike.
10. The most important thing to teach children is absolute obedience to whoever is in authority.
11. Children learn best by doing things themselves rather than listening to others.
12. Children must be carefully trained early in life or their natural impulses will make them unmanageable.
13. Children have a right to their own point of view and should be allowed to express it.
14. Children's learning results mainly from being presented basic information again and again.
15. Children like to teach other children.
16. The most important thing to teach children is absolute obedience to parents.
17. The school has the main responsibility for a child's education.
18. Children generally do not do what they should unless someone sees it.

19. Parents should teach their children that they should be doing something useful at all times.
20. It's all right for a child to disagree with his/her parents.
21. Children should always obey their parents.
22. Teachers need not be concerned with what goes on in a child's home.
23. Parents should go along with the game when their child is pretending something.
24. Parents should teach their children to have unquestioning loyalty to them.
25. Teachers should discipline all the children the same.
26. Children should not question the authority of their parents.
27. What parents teach their child at home is very important to his/her school success.
28. Children will be bad unless they are taught what is right.
29. A child's ideas should be seriously considered in making family decisions.
30. A teacher has no right to seek information about a child's home background

Developed by Earl S Schaefer and Marianna Edgerton

APPENDIX M  
RANK-ORDER OF PARENTAL VALUES

## Rank-Order of Parental Values

Here are three lists of qualities that parents feel are important for their child to learn. Rank them in order of their importance to you. In the first set, place a "1" beside the quality which you think is most important. Now place a "2" beside the quality which you think is next important, and so on.

- A. Which of the following qualities below do you value most for your child?
- a. to think for him/herself \_\_\_\_\_
  - b. to keep him/herself and his/her clothes clean \_\_\_\_\_
  - c. to be curious about many things \_\_\_\_\_
  - d. to be polite to adults \_\_\_\_\_
  - e. to be kind to other children \_\_\_\_\_
- B. The following is a list of qualities which might be considered important for a child to learn. Rank them in order of their importance to you. \_\_\_\_\_
- a. to obey his parents and teachers \_\_\_\_\_
  - b. to be responsible for his own work \_\_\_\_\_
  - c. to be kind and considerate \_\_\_\_\_
  - d. to keep his things neat and in order \_\_\_\_\_
  - e. to use his imagination \_\_\_\_\_
- C. Which of the following do you value most for your child? Rank in order of their importance to you?
- a. interest in how and why things happen \_\_\_\_\_
  - b. ability to get along with people \_\_\_\_\_
  - c. being a good student \_\_\_\_\_
  - d. ability to look after his/herself \_\_\_\_\_
  - e. good manners \_\_\_\_\_

Schaefer, E. S., & Edgerton, M. (1985). Parent and child correlates of parental modernity. In I. E. Siegel (Ed.), *Parental belief systems* (pp. 287-318). Hillsdale, NJ: Erlbaum.

APPENDIX N

TABLES

Table 1

*Correlations of Maternal Scaffolding Measures, Beliefs and Values, and Child Temperament*

	Maternal Scaffolding Measures				
	Cognitive Support	Directiveness	Praise	Criticism	Composite
Maternal Values					
Conformity	.46	.40	.27	.18	.36
Self-Direction	.02	.10	-.06	-.23	.08
Maternal Beliefs					
Progressive	.64**	.61*	.48	-.08	.58
Traditional	-.73**	-.61*	-.4	.17	-.62*
Overall Traditional	-.77**	-.67**	-.46	.17	-.67**
Child's Temperament					
Surgency	-.10	.10	.12	-.35	.10
Negative Affect	.10	.19	.41	-.15	.20
Effortful Control	-.20	-.35	-.54	.31	-.35

\*  $p < .06$

\*\*  $p < .05$

Table 2

*Correlations of Maternal Scaffolding and Child Performance and Self-Regulation*

Child Measures								
	STP <sup>a</sup>	PTP <sup>b</sup>	PTMT <sup>c</sup>	PTMP <sup>d</sup>	LTP <sup>e</sup>	LTMT <sup>f</sup>	LTMP <sup>g</sup>	LTP <sup>h</sup>
Maternal Scaffolding								
Cognitive Support	.17	.34	-.45	.43	.01	-.55	.11	.31
Directiveness	.37	.12	-.50	.44	-.02	-.51	.24	.33
Praise	.12	.10	-.47	.37	-.03	-.65*	-.17	-.05
Criticism	-.43	.24	.85*	-.30	-.21	.72*	-.02	.21
Composite	.30	.15	-.60	.45	.02	-.63*	.12	.22

\*p < .05

<sup>a</sup>Scaffolding Task Performance

<sup>b</sup>Post-test Task Performance

<sup>c</sup>Post-test Metacognitive Talk

<sup>d</sup>Post-test Monitoring Progress

<sup>e</sup>LEGO® Task Performance

<sup>f</sup>LEGO® Task Metacognitive Talk

<sup>g</sup>LEGO® Task Monitoring Progress

<sup>h</sup>LEGO® Task Persistence

Table 3

*Maternal Scaffolding and Children's Performance Crosstabulation*

	Performance <sup>2</sup>		Total
	Low Performance	High Performance	
Scaffolding Group <sup>1</sup>			
Low Scaffolding	3	2	5
High Scaffolding	4	1	5
Total	7	3	10

<sup>1</sup>Median split to create low and high groups on quality of maternal scaffolding.

<sup>2</sup>Median split to create low and high groups on experimental group task performance during the post-test and the LEGO® frog construction task

Table 4

*Maternal Scaffolding and Children's Self-Regulation Crosstabulation*

	Self-Regulation <sup>2</sup>		Total
	Low Regulation	High Regulation	
Scaffolding Group <sup>1</sup>			
Low Scaffolding	3	2	5
High Scaffolding	2	3	5
Total	5	5	10

<sup>1</sup>Median split to create low and high groups on quality of maternal scaffolding.

<sup>2</sup>Median split to create low and high groups on self-regulation strategies used by children in the experimental group during the post-test and the LEGO® frog construction task.

Table 5

*Comparisons between Experimental (Scaffolded) and Control Groups*

Child Variables	Child Groups	
	Experimental	Control
Pretest Performance	3.05 (3.02)	5.00 (2.98)
Posttest Performance	6.30 (2.50)	7.25 (4.14)
Change Scores	-1.60 (3.88)	-0.85 (2.29)
Self-Regulation	3.68 (1.10)	3.58 (1.23)
Metacognitive Talk	4.68 (5.89)	2.33 (2.63)

Numbers in parentheses are standard deviations.

APPENDIX O  
INSTITUTIONAL REVIEW BOARD



Academic Affairs  
Office of Academic Research • Institutional Review Board

December 07, 2015

Ms. Andria Clausell and Prof. Robert Ricco  
Department of Psychology  
California State University, San Bernardino  
5500 University Parkway  
San Bernardino, California 92407

**CSUSB  
INSTITUTIONAL  
REVIEW BOARD**  
Protocol Change  
IRB# 14084  
Status  
**APPROVED**

Dear Ms. Clausell and Prof. Ricco:

Your application protocol change to use human subjects, titled "Maternal Scaffolding and Children's Near and Far Transfer Problem-Solving Tasks" has been reviewed and approved by the Institutional Review Board (IRB). The attached informed consent document has been stamped and signed by the IRB chairperson. All subsequent copies used must be this officially approved version. A change in your informed consent (no matter how minor the change) requires resubmission of your protocol as amended. **Your application is approved for one year from the approval dates noted on the original IRB approval letter you received when your application was approved. One month prior to the approval end date you need to file for a renewal if you have not completed your research. See additional requirements (Items 1 – 4) of your approval below.**

Your responsibilities as the researcher/investigator reporting to the IRB Committee include the following 4 requirements as mandated by the Code of Federal Regulations 45 CFR 46 listed below. Please note that the protocol change form and renewal form are located on the IRB website under the forms menu. Failure to notify the IRB of the above may result in disciplinary action. You are required to keep copies of the informed consent forms and data for at least three years. Please notify the IRB Research Compliance Officer for any of the following:

- 1) **Submit a protocol change form if any changes (no matter how minor) are proposed in your research protocol for review and approval of the IRB before implemented in your research,**
- 2) **If any unanticipated/adverse events are experienced by subjects during your research,**
- 3) **To apply for renewal and continuing review of your protocol one month prior to the protocols end date,**
- 4) **When your project has ended by emailing the IRB Research Compliance Officer.**

The CSUSB IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, the IRB Compliance Officer. Mr. Michael Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at [mgillespie@csusb.edu](mailto:mgillespie@csusb.edu). Please include your application approval identification number (listed at the top) in all correspondence.

Best of luck with your research.

Sincerely,

*Judy Sylva*

Judy Sylva, Ph.D., Chair  
Institutional Review Board

JS/mg

cc:

909.537.7588 • fax: 909.537.7028 • <http://irbcsusb.edu/>

5500 UNIVERSITY PARKWAY, SAN BERNARDINO, CA 92407-2393

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