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THE SOCIAL CONTEXT OF PRESCHOOLER SOCIAL PROBLEM SOLVING:

ASSOCIATIONS WITH MATERNAL SOCIAL PROBLEM SOLVING AND

NUMBER OF SIBLINGS

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ABSTRACT

This thesis investigated how preschooler social problem solving skill is associated with maternal social problem solving skill and the number of siblings. Mothers and their preschool-aged children were examined in a normative, low-SES sample and a low-SES sample with a history of substantiated maternal perpetration of child maltreatment. The first hypothesis, that there would be a positive association between maternal and child social problem solving was not supported in the normative sample. In the perpetrator sample, however, there were significant positive associations between mother and child skill, which were affected by maternal IQ. The second and third hypotheses, that the number of siblings in the home would be positively associated with child skill even after the effect of maternal social problem solving is removed, received support in both samples. Though the number of siblings was associated with increased overall social problem solving skill in both samples, findings varied depending on the type of problem the child faced in the perpetrator sample, specifically the number of siblings was associated with mother-focused, but not peer-focused dilemmas. The fourth hypothesis, that the presence of siblings would decrease the direct association between mother and child skill was not supported. However, there was a significant interaction between one indicator of maternal social problem solving and the number of siblings in the perpetrator sample wherein the association between mother and child skill increased as the number of siblings in the home increased. Findings suggest that preschool-aged child problem solving is associated with family factors, including the number of siblings a child has. The study further indicates that effect of siblings may vary depending upon the level of familial risk.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

The Social Context of Preschooler Social Problem Solving:

Associations with Mother Social Problem Solving and Number of Siblings

Introduction

The development of social problem solving skills is a fundamental task of early childhood. Children learn to attend to the environment, identify relevant information, organize that information, and determine an appropriate response. A number of psychologists have attempted to explain how children acquire the capacities needed to understand and interact with the social environment (Bandura, 1986; Piaget, 1929/1965). Preschool age is an especially critical transition period in the development of these capacities (Wellman, Cross & Watson, 2001). Significant changes are seen in children's performance on social cognitive tasks (e.g., false belief understanding tasks; McAlister & Peterson, 2006), as well as in social behavior (e.g., initiation and development of peer relationships; Howes, 1987). One capacity that can be used to connect a child's development in social behavior and social cognitive skill is social problem solving. Social problem solving skill is an individual's ability to recognize a social problem, develop alternative solutions to that problem, and choose and implement a solution successfully.

Deficits in social problem solving skill have been linked to a host of mental health problems in children and adults. In children, difficulties related to social problem solving deficits include high levels of oppositional behavior, low sociometric status, and low social-emotional competence in the classroom (Pettit, Dodge & Brown, 1988; Richard & Dodge, 1982; Spivack & Shure, 1974). In adults, associations have been found between social problem solving deficits and increased anxiety, negative affectivity and law-breaking behavior (Davey, Jubb & Cameron, 1996; Heppner, Reeder & Larson, 1983; McGuire, 2001). Despite these findings supporting the importance of the construct, little research has addressed the development of social problem solving. The focus of the present

project was to examine whether an association exists between of maternal social problem solving skill, the number of siblings a child has, and preschoolers' own social problem solving skill. Although previous research has not addressed the development of preschooler social problem solving within the context of maternal skill and the number of siblings specifically, studies in other areas of child development suggest that both parent characteristics and the number of siblings likely influence child social cognitive capacities (Howe & Rinaldi, 2004; Petrill & Deater-Deckart, 2004), including social problem solving (Hadwin, Garner, & Perez-Olivas, 2006). For example, parent and sibling characteristics

have been shown to influence child risk for emotional and behavioral disorders (Dodge, Bates, & Petit, 1990; Volling, McElwain, & Miller, 2002) and aggressive behavior (Halford, Sanders, & Behrens, 2000; Kim, McHale, Crouter & Osgood, 2007). In turn, externalizing disorders have been linked to social problem solving deficits (Crick & Dodge, 1996; Spivack & Shure, 1974). It is, therefore, reasonable to argue that both parent characteristics (e.g., maternal social cognitive skill) and aspects of family composition (e.g., the number of siblings) impact the development of young children's social problem solving skill. The present study examined this hypothesis.

Social Problem Solving and Social Information Processing

First introduced in the 1970's (D'Zurrilla & Goldfried, 1971; Spivack, Platt & Shure, 1976), social problem solving refers to an individual's ability to detect and to appropriately respond to challenges in a social setting. Social problem solving has been conceptualized as a series of discreet processes. These processes include (a) problem definition, (b) generation of multiple alternative solutions to the problem, (c) decision making with implementation of a solution, and (f) verification of the implemented solution (D'Zurrilla & Goldfried, 1971). These are typically assessed in research by examining individuals' capacity for means-end thinking (Spivack, Platt & Shure, 1976). Early

work in social problem solving approached the construct developmentally, and suggested that while adults and older children solve social problems in the steps outlined above, preschool-aged children have not fully developed the capacity for means-end thinking. Instead, researchers asserted that the first skill to emerge in the development of social problem solving is alternative solution generation (Spivack, Platt & Shure, 1976). Therefore, the early developmental capacity of preschool-aged children is best captured using children's ability to develop alternative solutions to social dilemmas.

Social problem solving can be considered one skill within the larger domain of social information processing (SIP), therefore findings of SIP research can be applied to the understanding of social problem solving. SIP models describe how cognitive processes may mediate social behavior and are extensions of previous social learning theories (e.g., Bandura, 1986) and social skills models (e.g., McFall, 1982). In fact, the steps of social problem solving introduced above have been incorporated into more contemporary models of SIP (Crick & Dodge, 1994) and have been applied to social behavior at different developmental stages (Azar, 1986; Fite, Bates, Holtzworth-Munroe, Dodge, Nay, & Pettit, 2008; McFall, 1982; Milich & Dodge, 1984; Milner, 2003). For instance, SIP differences have been associated with adult domestic violence (Clements & Holtzworth-Munroe, 2008), parent-to-child violence (Azar, Robinson, Hekimian, & Twentyman, 1984; Milner, 2003) and criminal history of persistent violence in males (James & Seager, 2006). SIP models in children link social information processes to child maladaptive behavior, most often overt aggression (Crick & Dodge, 1996). Although SIP has been examined in adults and children independently, cross-generational associations between parent and child skills and biases have not been fully examined (e.g., Duman & Margolin, 2007; MacKinnon-Lewis, Castellino, Brody & Fincham, 2001; McDowell, Parke & Spitzer, 2002). A goal of the present study was to examine the cross-generational associations between the social problem solving skill of mothers and their preschool-aged children.

The Relation between Parent and Child Social Information Processing

    Theoretical bases for the association between parent and child SIP.

Developmental theories highlight children's transactions with others as essential to their development of social understanding (Baldwin, 1992; Dunn, 1983; Gauvain, 2001; Maccoby, 1992). Most crucial are transactions within the family (Carpendale & Lewis, 2004; Thompson, 2006). The family includes a variety of important "others" (e.g., parents, siblings, and grandparents) who are salient agents for young children's social learning (Fisak & Grills-Taquechel, 2007; Maccoby, 1992).

A variety of theories outline mechanisms for the influence of family on children's development of social problem solving skill. Social learning theory (Bandura, 1986) and Vygotskian theory (Vygotsky, 1978) are especially relevant to the proposed project. Both of these theories highlight the importance of the child-caregiver dyad in the development of social capacities and, though not a component of the individual theories themselves, provide evidence for the potential role of social information processing in behavioral transmission within the family. They also outline mechanisms that can be used to understand how children's sibling interactions can affect social problem solving skill. These two theories are briefly reviewed below in an effort to provide a rationale for this study's focus on the relation between maternal skill, the number of siblings, and children's social problem solving development.

Bandura's (1986) concept of observational learning provides one mechanism for the link between a child's observation of parents' and siblings' interpersonal behaviors and her or his own internalized representations of appropriate social interaction – that is, through the lens of this theory, the family can be seen as a child's most fundamental and earliest source of modeling of effective (and ineffective) social problem solving strategies. In fact, researchers studying problem solving more generally have invoked concepts from Bandura's theory as mechanisms in the acquisition of social

problem solving skill (e.g., "transfer of training" or vicarious reinforcement, D'Zurilla & Goldfried, 1971). For example, a child can observe a parent or sibling successfully solve a challenging social situation by her/his use of effective social problem solving strategies. This experience of success positively reinforces the parent or siblings' use of the skill and it increases the probability that the child observing this success will use that social solution in future, similar situations (Bandura, 1977). Over time, children develop internalized representational models of these solutions that lead to the development of a repertoire of interpersonal behaviors (Putallaz, Costanzo, Grimes & Sherman, 1998). Historically, the concept of internalized representations has served as a bridge between behavioral learning theory, which focused primarily on direct reinforcement of one's own behavior, and the posited social learning processes described by social learning theory.

Vygotskian theory (1978) can be used to conceptualize the family as a source of training of social problem solving skill. Parents and other more experienced learners within the child's home environment guide the child through interpersonal problems that are beyond the child's current level of ability (i.e., they "scaffold" the child's learning). These experts estimate the abilities and needs of children and offer support, allowing children to accomplish tasks just above their developmental level (i.e., what Vygotsky calls their "zone of proximal development"), thus moving them towards a more sophisticated level of development. Vygotsky's theory focuses on adult-child interactions. However, scaffolding may be extended to any dyadic interaction between an expert and a learner, and is thus applicable to the child-sibling dyad as well. Indeed, older siblings have been found to engage in teaching behaviors similar to parents (Azmitia & Hesser, 1993). Thus, both siblings and parents actively support children's social development through verbal and behavioral scaffolding. Although not explicitly stated, this process also highlights the fact that a child's success in navigating this zone is highly dependent on the social problem solving ability of the expert in approximating the child's

skill level. Additionally, it is likely that the experiences gained as either an older or younger sibling,

teacher or learner, affect the acquisition of social cognitive skills (e.g., McAlister & Peterson, 2006).

That is learning and teaching both likely promote an earlier development of social cognitive skills

(e.g., the "sibling effect", Perner, Ruffman & Leekam, 1994; Jenkins & Astingon, 1996).

Bandura's (1986) and Vygotsky's (1978) theories support the argument that the family plays

an important role in the social cognitive development of children and the development of social

problem solving in particular. Both parents and older siblings serve as models (Bandura, 1986) and

active teachers (Vygotsky, 1978) of the elements of social problem solving. Thus, they impact the

content of preschool-aged children's cognitive architecture (e.g., internalized representation,

cognitive repertoire, interpersonal scripts).

Empirical research on the relation between parent and child SIP.

Previous literature on the associations between social information processing and interpersonal

behavior supports the idea that there may be a positive relation between child and maternal social

problem solving. This literature documents the intergenerational and intrapersonal links between

social information processing and interpersonal behavior both generally and between particular

domains of social cognitive functioning. First, studies on the intergenerational associations between

maladaptive parent behavior and lower child social cognitive skill, including poorer social problem

solving skill, are discussed. Second, investigations of intrapersonal associations are reviewed,

focusing on links between adult social information processing and their own interpersonal behavior.

Third, the cumulative evidence provided by both intrapersonal and interpersonal research related to

social problem solving is surveyed. This literature suggests that the link between parent behavior and

child social information processing may be at least partially mediated by parental social cognitive

skills (i.e., maternal social problem solving). Finally, previous research supporting a direct

intergenerational link between child and parent social information processing is presented. A significant body of research on the cross-generational associations in SIP has focused upon SIP processes other than social problem solving (e.g., attributions). Theoretically, the development of SIP processes should be similar. Therefore, the literature reviewed includes research on general SIP processes, as well as investigations specific to social problem solving.

To begin, previous research has demonstrated that there is a link between parent behavior and child social information processing, including social problem solving skill. For instance, heightened levels of parental aggression have been associated with a variety of child social information processing (SIP) deficits (Dodge, et al., 1990; Dodge, Bates, Pettit, Valente, 1995). In fact, an array of parental behaviors including harsh/negative parenting (Cole, et al., 2007), marital violence (Halford, Sanders, & Behrens, 2000) and modeling of anxious behavior (Fisak & Grills-Taquechel, 2007) have been linked to children's SIP. Most relevant are findings that parental aggression has been connected to the content of child social problem solving strategies. For instance, children of parents that engage in aggressive behavior show an increased endorsement of aggressive problem solving tactics (Goodman, Barfoot, Frye, & Belli, 1999) and utilization of polarized passive and aggressive social solutions (Rosenberg, 1987).

It is possible that parents' own cognitive processing deficits partially account for these observed associations between negative parental behavior and child social cognitive skill. That is, research on the intrapersonal associations between adult social information processing and interpersonal behavior has shown that adults' aggressive behaviors are related to deficits in their own social information processing (James & Seager, 2006; Dill, Anderson, Anderson & Deuser, 1997). In addition, coercive parental behavior has been linked to parents' unrealistic expectations and hostile intent attributions of their children's behavior (Azar & Rohrbeck, 1986; Dadds, Mullins, McAllister & Atkinson, 2003;

Larrance & Twentyman, 1983; Montes, de Paul & Milner, 2001). More proximally, deficits in parents' own social problem solving have been linked to harsh parenting behaviors (Azar, Robinson, Hekimian & Twentyman, 1984; Hansen, Pallotta, Christopher & Conaway, 1995; Wasik, Bryant & Fishbein, 1981). These findings support the idea that SIP processes act as filters for the way that aggressive parents perceive and interact with the world, including their children, and likely affect their children's perceptions of the world through processes parent-child interactions such as modeling and scaffolding.

Preliminary studies support associations between the SIP biases of parents and those of their children, but definitive findings for intergenerational links in social problem solving skill, in particular, are lacking. For example, studies have shown that mothers with higher levels of hostile intent attributions have daughters and sons with similarly high levels of hostile intent attributions (Bickett, Milich & Brown, 1996; MacBrayer, Milich & Hundley, 2003). As attributions are a key component of SIP (Azar, Reitz & Goslin, 2008; Crick & Dodge, 1994; Milner, 2003), this suggests that there may be other SIP processes that are associated across generations.

Although many studies support a relationship between parent and child social information processing, only a few direct examinations of the parent cognition-child cognition relationship have been completed. Instead, researchers typically rely on behavioral measures as proxies of parental social information processing. For example, in a prospective longitudinal study of 585 children, Fite and colleagues (2008) examined the relationship between inter-parent aggression when a child was five years of age and the child's own romantic aggression from ages 18 to 21. The authors found that child SIP at ages 13 and 16 mediated the relation between inter-parent aggression and the child's own later romantic aggression. The authors suggested that parent SIP likely affects child SIP. However, because SIP was not measured in parents, this conclusion remains unsubstantiated.

A second study found that children's SIP deficits partially mediated the relation between perceived childhood parental rejection and later intimate relationship abuse perpetration (Taft, Schumm, Marshall, Panuzio & Holtzworth-Monroe, 2008). The researchers asked an adult sample to complete retrospective self-report measures of childhood exposure to inter-parent violence as well as adult measures of SIP. Although the Taft and colleagues (2008) study argues that childhood experiences shape social information processing style, the influence of parental SIP was not examined. Studies such as the ones discussed above have added to the field's understanding of behavioral transmission of aggression by positing cognitive mediators and focusing on behavioral proxies or retrospective reports. The present study provides a different level of analysis by examining the direct association between parent and child social problem solving.

Limitations of previous research examining parent and child social problem solving.

As has been hypothesized for other SIP capacities (Milner, 2003), it is likely that parents' social problem solving skills is associated with their offspring's social problem solving skills. Two recent studies have examined the relationship between parent and child social problem solving skill (Duman & Margolin, 2007; McDowell, Parke & Spitzer, 2002) and found links between some elements of parent and child social problem solving (e.g., father and child prosocial solutions, McDowell, Parke & Spitzer, 2002) though not between others (e.g., mother hostile social problem solving and child hostile problem solving, Duman & Margolin, 2007). Duman and Margolin (2007) examined the association between 9-10 year-olds' aggressive social problem solving, the aggressive problem solving of their parents, and parental marital aggression and found that the relationship between child and adult aggressive problem solving strategies was moderated by the amount of marital violence in the home. McDowell, Park and Spitzer (2002) examined the association between the social goals and strategies of kindergarten-aged children and their parents and found that here was

a relationship between father and child relational-prosocial goals in family vignettes, but not peer vignettes. While these two studies present findings on the intergenerational transmission of social problem solving, the inferences that can be drawn from them are unclear due to aspects of the studies' designs. These methodological limitations are discussed below and were addressed in the present study.

As is discussed in detail later, social problem solving skill is generally measured via participants' solutions to hypothetical social dilemmas. These social dilemmas can be restricted to a single context (e.g., subjects can be asked to solve problem scenarios only related to peers), or can include multiple contexts (e.g., participants can be asked to provide solutions to multiple contexts, including friends, family and romantic partner). In order to best measure the association between mother and child social problem solving skill, it may be best to capture their responses to problems related to multiple contexts (e.g., home relationships, peer relationships). The importance of including problems specific to the mother-child dyad is supported by the findings that social problem solutions vary by who is involved in the problem and/or the context in which the problem occurs (i.e., there is *domain specificity,* Madison, 2007). Moreover, problem solving within the family may require distinct strategies from successful problem solving in another social realm (e.g., peer relationships) to be successful. Therefore, by only examining the association between maternal problem solutions in spousal scenarios and child problem solutions in peer scenarios, as did Duman & Margolin (2007), researchers ignored the parent-child context, which may have the most cross-generational relevance. In order to appropriately measure the intergenerational associations in social problem solving skill, mother-child social dilemmas should be included. Specifically, mother social problem solving skill assessment should include child-focused dilemmas (e.g., "Pam is at the store with her baby when the baby gets cranky and starts to throw a temper tantrum. The story ends with

the baby being quiet and content. What can Pam do to calm her baby?") and child social problem solving skill should include parent-focused dilemmas (e.g., "Charlie broke his mom's flower vase. What can he do so she won't be mad?"). In this way, mothers and children's social problem solving skill are compared within the same context in which it is modeled and taught.

In testing whether there was a cross-generational relationship between child and parental aggressive social problem solving Duman and Margolin (2007) did not use hypothetical dilemmas that focus on the parent-child problem context. That is, they did not measure parent problem solving in child-based dilemmas, nor did they administer parent-focused dilemmas in the child assessment. Thus, they left the direct parent-child problem context unstudied. Similarly, in a study of the association between kindergarten-aged children's social goals and strategies and parental social goals and strategies, McDowell, Parke & Spitzer (2002) discussed the importance of problem context and measured both peer and parent contexts. However, they did not report the association found between the strategies of parents and children in the parent-child context.

Despite the previous authors' seeming lack of measurement and/or reporting of the association between parent and child social problem solving within the family context, their findings support the necessity of context-specific measurement. That is, both groups of researchers reported differences in the quality and content of solutions by problem context. For instance, Duman and Margolin (2007) reported that the content of parental responses to the social dilemmas varied between peer- and spouse-dilemmas. Additionally, McDowell, et al., (2002) found differences in the content of children and mothers' social problem solutions between peer and family context. Therefore, both of these studies suggest that future research on the intergenerational link in problem solving should consider the parent-child context. The present study includes parent-focused

dilemmas for children and child-focused dilemmas for parents to directly examine the parent-child context in the cross-generation association of social problem solving.

The second methodological limitation in the previous studies examining maternal-child intergenerational links was the measurement of social problem solving skill. Breadth, number of social solutions and irrelevant responses, are replicated indicators of social problem solving skill (Shure & Spivack, 1974; Shure, Spivack & Jaeger, 1971; Wasik, Bryant, & Fishbein, 1981). These measures have been found to differentiate between groups at different levels of risk in both children and parents (e.g., the number of solutions a mother provides to hypothetical dilemmas relates to a mother's risk of child neglect, Azar, Read, & Proctor, 2008). However, due to pronounced interest in the content and quality of the solutions, the prior studies of the intergenerational association of problem solving did not use the breadth or number of solutions to measure social problem solving skill. Instead, the researchers relied upon ratings of the content of problem solutions (e.g., aggressive vs. assertive, Duman & Margolin, 2007; relational-prosocial vs. instrumental-confrontational, McDowell, et al., 2002). Though the quality-based categorizations capture the content of the solutions, they do not assess the breadth of the solutions provided. In fact, McDowell, et al., 2002 only coded the first solution offered by the child, thus dismissing previous findings that the problem solving ability of young children is best captured by the generation of alternative solutions (Spivack, Platt & Shure, 1976). The present study included the number and the breadth of solutions as measures of social problem solving skill for both parents and children.

Finally, although there is little doubt that one's causal attributions of interpersonal situations impact social problem solving skill (D'Zurilla & Nezu, 1999), the two constructs are distinct and should be measured as such. However, prior studies did not adequately distinguish between social problem solving and biases in attribution. Duman and Margolin (2007) described their study as

measuring social problem solving, but their measurement of social problem solving skill confounded social problem solving capacity with biases in attributions. The researchers measured children and parents' social problem solving skill via responses to ambiguous and provocative social scenarios. Research suggests that responses to vague, possibly aggressive stimuli activate an individual's tendency to ascribe hostile intent to others. In fact, Crick and Dodge (1996) have established this paradigm as a measure of hostile attribution bias. In contrast, the measurement of social problem solving has typically been done using participant's responses to problem vignettes describing common, unambiguous interpersonal dilemmas (Spivack, Platt & Shure, 1976). The problem solving data used in the present study examined the construct of social problem solving skill by measuring parent and child responses to common, non-ambiguous, hypothetical situations.

Of note is the early research by Spivack, Platt and Shure (1976) on the relationship between alternative solution generation of mothers and their children. Their findings indicate that there is a positive relationship between the number of maternal solution and the number of solutions provided by daughters, but not sons. Interestingly, the link between more advanced maternal means-end problem solving and preschooler alternative solution generation was not measured, and is thus a focus of the present study.

The Impact of the Sibling Relationship on Social Problem Solving

The majority of the studies on the development of social information processing within the family relates parental social information processing to child social information processing (e.g., Fisak & Grills-Taquechel, 2007; Hadwin, Garner & Perez-Olivas, 2006). However, in order to obtain a more complete understanding of the development of social problem solving within the family system, familial relationships beyond the parent-child dyad must be considered (Carpendale & Lewis, 2006; Lamb & Sutton-Smith, 1982; Minuchin, 1985). The sibling relationship is a salient

component of a family system. Most children grow up in a household with a sibling (Hernandez, 1997), and children spend more time with siblings than in any other interpersonal relationship during childhood (McHale & Crouter, 1996). Further, sibling characteristics, including constellation variables (e.g., birth order, sibling sex) and relationship quality, have been linked to differences in children's development, including social-emotional and psychological adjustment (Kilmer, Cook, Taylor, Kane & Clark, 2008; Pike, Coldwell & Dunn, 2005; Sharpe & Rossiter, 2002). Given the time spent with siblings (McHale & Crouter, 1996), and the documented impact of the presence of siblings on other contexts of children's socio-emotional development, the number of siblings a child has should be considered as an influence on child social problem solving skill within the family system.

Based on the developmental theories discussed earlier (Bandura, 1986; Vygotsky, 1978), the social problem solving skills of preschoolers may be enhanced by the presence of older or younger siblings. The complementary nature of sibling interaction, wherein older siblings generally lead interactions and the younger siblings generally observe and imitate (McCoy, Brody & Stoneman, 1994; Teti, 2002), provides consistent opportunities for teaching and learning for both older and younger siblings. First, younger siblings may benefit from exposure to multiple "experts" (i.e., parents and siblings) who model and scaffold their social cognitive development (Azmita & Hesser, 1993). Second, the social cognitive skill of an older sibling is likely affected by teaching a younger sibling. Research on the effect of sibling interactions for preschool-aged children who are older siblings is sparse. However, research has shown that older siblings are often placed in a parent-like role in relation to their younger siblings (Howe & Ross, 1990) and that siblings serve as support figures throughout the lifespan, especially during times of stress (Teti, 2002). It is likely that this supportive role requires the older sibling to solve more daily social problems in their interaction with

younger siblings. This increased frequency and perhaps complexity of problem solving may increase the older child's own social problem solving skills, as has been found in the educational literature demonstrating positive effects of teaching on children's social skill (Damon, 1984; Maynard, 2002). Finally, the presence of siblings may lead children to gain more experience with social problem solving skills through the observation of additional instances of parental scaffolding and modeling (Sabbagh & Callanan, 1998). That is, because children with siblings have an increased number of interpersonal interactions with similar-age children within the home, they receive more scaffolding from surrounding adults regarding social interactions (Howe & Ross, 1990; Howe & Rinaldi, 2004).

The positive effect of siblings on the early development of social problem solving is supported by the finding that the number of siblings (older or younger) in a preschooler's home positively predicts performance on a theory of mind battery, even while controlling for age and level of verbal functioning (McAlister & Peterson, 2006). Further, for preschoolers, the mere presence of siblings in the family is associated with an earlier development of false belief understanding than when siblings are not present (i.e., the "sibling effect", Perner, Ruffman & Leekam, 1994; Jenkins & Astingon, 1996). So the presence of siblings appears to have a positive influence on early social cognitive precursors to social problem solving. Together, these findings demonstrate the potential for sibling presence to positively influence the development of skills that are needed for successful social problem solving, and thus may enhance preschooler social problem solving skill.

It should be noted that the presence of siblings does not always have a positive effect upon children's social competence. A frequently noted example of this focused on a later developmental period than the present study, and found that siblings influence the development of coercive interpersonal behavior within the family system (i.e., coercive cycles, Patterson, Dishion, & Bank, 1984). Specifically, siblings are a source of negative reinforcement, wherein an aversive interaction

is terminated upon negative behavior on the part of the target child. In families where this form of negative reinforcement is seen, negative behavior is observed at a higher rate (e.g., physical and verbal acting out). Because such negative interpersonal behavior is associated with problem solving difficulties (McGuire, 2001; Spivack & Shure, 1974), this research suggests that siblings may negatively affect the social problem solving skill of older children.

Some researchers have argued that siblings are more likely to have a negative impact on social behavior in samples of families who experience a significant amount of intra-family and extra-family risk, like domestic violence, child abuse/neglect, and/or poverty. However, Stormshak, Bellanti and Bierman (1996) found that children in high-risk environments who have a positive sibling relationship receive emotional support from their siblings and that their siblings foster the development of social skills. Further, resiliency theorists have found that resiliency is more the norm than the exception (Masten, 2001; Masten & Wright, 2009), and suggests that a positive experience with a sibling can serve as a protective factor for child outcome. Therefore, while it is possible to see that large numbers of siblings may be linked to a more negative family environment, the present study hypothesized that there is a positive, protective effect of siblings on preschooler social problem solving.

In sum, research has shown that the experience of being either an older or younger sibling affects the acquisition of social cognitive skills (e.g., Theory of Mind, perspective taking). Each of these skills can be seen as requisite to social problem solving, and though research has yet to examine the effect of siblings on social problem solving skill directly, this literature suggests that children with more siblings will have stronger social problem solving skills. The theoretical mechanisms for this difference are that family members beyond the parents provide additional models and teachers of social problem solving skills, more opportunities to practice via teaching the skills to siblings,

increased chances for observation of live social problem solving, and more scaffolding by parents. The present study examined whether the number of siblings increases a preschool child's social problem solving skill.

The impact of siblings on child social problem solving likely varies by other characteristics of the family system. Of interested to the present study is the level of social problem solving skill of the mother. Two ways that the presence of an increased number of siblings may relate to the association between mother and child social problem solving are (1) independent prediction of the number of siblings and (2) sibling moderation of the mother-child association. First, the number of siblings may explain variance in preschooler social problem solving performance independent of maternal social problem solving skill. Second, the number of siblings may weaken the relationship between mother and child social problem solving. This so called "buffering interaction", in which a third variable decreases the direct effect of the predictor variable on the outcome (Cohen, Cohen, West & Aiken, 2003), could occur for three reasons. First, the presence of older sibling(s) could provide an additional model and teacher beyond the mother. In this way, the presence of additional models and teachers would dilute the direct link between the mother and the child by increasing the number of experts available to the target child. That is, beyond learning strategies from their mother, children will adopt additional strategies from their siblings. Second, the presence of more than one child in the household may place increased cognitive demands on the mother, thus increasing the probability that her finite time and cognitive resources be allocated to processes other than modeling or actively teaching social problem solving to the target child (Strohschein, Gauthier, Campbell, & Kleparchuk, 2008). That is, the presence of a sibling may reduce the amount of time parents spend as direct interaction partners (Blake, 1989), thereby decreasing the direct link between child and mother social problem solving skill.

The Present Study

The present study examined the link between young child social problem solving skill and maternal social problem solving skill. To include a broader view of familial influence on children's social problem solving capacities, the present study also examined the association between the number of siblings and child social problem solving skill. Study hypotheses were tested in two levels of familial risk. The first sample was a normative low-SES sample of mother-child dyads. The second sample was also of low-SES sample, but also had a substantiated history of mother-perpetrated child maltreatment. The two samples allowed for an examination of the impact of maternal social problem solving and the number of siblings on child social problem solving across two samples of different levels of familial risk.

Parent-child interaction and intergenerational transmission of social behavior has been a primary focus of study in child maltreatment (Azar & Twentyman, 1986; Dodge, Bates & Pettit, 1990 Widom, 1989). In fact, a number of studies, including ones from the larger data set from which the present project samples was drawn, have found differences in maternal problem solving, with maltreating mothers showing poorer problem solving capacities than non-maltreatment comparison samples (Azar & Robinson, 2008; Azar, Robinson, Hekimian, & Twentyman, 1984; Azar & Twentyman, 1986; Hansen, Pallotta, Christopher, Conaway & Lundquest, 1995). In addition, children exposed to domestic violence and maltreatment have shown deficits in problem solving ability (Fite et al., 2008) and social-emotional skills necessary to complete problem solving tasks (Sroufe & Egeland, 1983). Other early intergenerational research suggested that the process underlying this deficit transmission was that exposure to deviant maternal values impacted child peer relationship via child social problem solving skills (Pettit, Dodge & Brown, 1988). However, maternal skills were assumed based on childhood exposure to negative family experiences, and were

not examined. Study of the relationship between the social problem solving skills of mothers and their children within a maltreating sample, even in a preliminary way, thus may be warranted. Therefore, in addition to examining the study questions within a normative sample of mothers with low-SES and their preschoolers, the study questions were also examined within a higher risk sample, where the mother had at least one incident of child maltreatment.

The following hypotheses were tested:

Hypothesis 1. Maternal social problem solving skill (i.e., categories of solutions, elaborated solutions, and low irrelevant responses) would be significantly and positively associated with preschooler social problem solving skill (i.e., alternative solution generation, repeated solutions, and low irrelevant responses).

Hypothesis 2. There would be a significant, positive association between preschooler social problem solving skill and the number of siblings in the home. That is, as the number of siblings in the home increases, there would be an increase in the number of alternative solutions generated, the number of repeated solutions, and a decrease in the number of irrelevant solutions by children.

Hypothesis 3. The number of siblings in the home would significantly predict preschooler social problem solving skill even after accounting for maternal social problem solving skill.

Hypothesis 4. The presence of siblings would decrease the direct relation between maternal social problem solving and child social problem solving. Specifically, the presence of one or more siblings will weaken the association between maternal skill and child skill, thus serving as a moderator of this association.

Although the primary goal of this study was to explore the association between maternal and child social problem solving, given that both mother and child have other contextual factors that may

influence their problem solving skills, some other relevant factors were explored. Exploratory

analyses were conducted to assist with the interpretation of the findings presented in hypotheses 1-4.

The associations between perpetration status, maternal social problem solving skill, child social

problem solving skill and context variables consistent with the theoretical foundation of the present

study were examined. Three context variables that may be important are maternal depressive

symptomatology, maternal partnership status (i.e., single or partnered), and hours the child spends in

out-of-home care.

A substantial number of studies have found that deficits in adult social problem solving are

associated with maternal psychological distress, particularly depression (Davey, Jubb & Cameron,

1996; Dixon, 2000; Heppner, Reeder & Larson, 1983; Nezu, 1987). In addition, mothers with

depression have been shown to engage less with their children than mothers without depression (e.g.,

Foster, Garber & Durlak, 2008), likely impacting the quality of the maternal scaffolding of child

social problem solving skill and resulting in lower child social problem solving skills.

Further, because the present study conceived of child social problem solving as developing

within an environment influenced by the modeling and scaffolding of others, child exposure to adult

modeling and scaffolding of social problem solving would likely be affected by the presence of a

maternal partner in the home. Single parent homes have less parental resources to devote to children

than dual-parent homes. Thus, the presence of an additional caregiver would increase the diversity

and availability of models and active teachers of social problem solving and likely increase child

social problem solving skills.

Finally, extra-familial supports in the form of external caregivers and peers may act as

additional models and teachers of social problem solving, thus also leading to stronger child social

problem solving. The impact of childcare on social problem solving development may be especially

important for this sample in which a high number of families have been identified by the social

service system to be in need of support and placed in Head Start or other early intervention programs.

Method

Participants

        The present study drew from a larger NIMH-funded parenting study (Azar #

5R29MH046940), which sampled mothers from low-income households with at least one child

between the ages of three and six. The normative sample is comprised of 56 mother-child dyads with

no history of involvement with Child and Youth Services. The perpetrator sample is comprised of 48

mother-child dyad with a history of state-substantiated maternal-perpetrated physical abuse or neglect

as measured by a review of the MA Department of Social Services official records. Full

demographics for both samples are presented in Table 1. There were 6 dyads that met criteria for the

present study, but were not included due to incomplete child assessments. One of these dyads was in

the control group and 5 were in the perpetrator group, which is consistent with previous research

suggesting limitations on the "testability" of children, especially male children, with histories of

physical abuse (Trickett, 1993).

        To examine differences in the sample that may account for variations in findings,

demographic differences between samples by child sex were examined via two-way ANOVA

(sample by sex) and two-way Chi-Squared analyses (sample by sex) (Table 2). The two samples

were not significantly different on maternal age, maternal IQ, maternal unemployment, the number of

siblings in the family, parent status (single- or partnered-mother), child age, or child Peabody Picture

Vocabulary Test score (PPVT) (Table 1). In fact, the only significant difference between the

samples was in maternal education (F (1,99) = 8.97, p = .003), wherein the normative group had more

years of education than the perpetrator group. This is consistent with previous research with

perpetrators of maltreatment, which found that low education is a risk factor for maltreatment

(Brown, Cohen, Johnson & Salzinger, 1998). There was one main effect for sex, wherein girls were,

on average, younger than boys (F (1,99) = 5.53, p =.02). Finally, there was one significant

interaction between sample and sex, wherein males in the perpetrator group had significantly lower

SES than males in the control group, and there was no significant difference in SES between females

across samples. In sum, the two demographic differences between samples were a significant

difference in years of education between the samples, and an interaction between sample and sex on

SES. Because sex is not a focus of the present study, SES will not be examined further. However,

the possible impact of maternal education between the two samples will be considered when findings

are interpreted.

Procedures

Mothers were recruited through a variety of parenting agencies, daycare centers and preschool

programs (e.g., Head Start) using flyers and staff personnel. All mothers were paid a small amount of

money for their participation in the study. Data collection for the larger study was completed in two

sessions, the first in the home and the second in a university laboratory. At the time of the first visit, a

study staff member reviewed the details of the study with mothers who had volunteered to participate

and mothers completed consent forms. Mothers then provided background information (age,

education, etc.), and were given a set of paper-and-pencil measures, as well as administered the

Parent Problem Solving Instrument (PPSI; Wasik, Bryant & Fishbein, 1981). Due to potential

maternal literacy issues, interviewers read consent forms and all questionnaires aloud to the

participants and recorded responses verbatim for the PPSI. At the second session, the Preschool

Interpersonal Problem Solving Assessment (PIPS; Shure & Spivack, 1974) was administered to each

preschooler. All staff were blind to group membership.

Measures

    Demographic Background Sheet. (Appendix) A background form was used to collect sociodemographic information, including mother's age, race, marital status, and educational level, along with children's age, birth order and the number of siblings in the family. Educational level and parental occupation were used to calculate the two-factor Hollingshead indicator of socioeconomic status (Hollingshead, 1975).

    The Wechsler Adult Intelligence Scale – Revised (WAIS-R; Wechsler, 1981) was used to measure maternal cognitive ability. Six sub-scales were administered to the mothers (three verbal subscales: information, vocabulary, comprehension, and three performance subscales: picture completion, picture arrangement and digit span) and used to calculate a prorated IQ score. The WAIS-R was widely used in both clinical and research work and has been shown to have high test-retest reliability ($r = .70 - .90$) and to correlate with other measures of cognitive ability.

    The Peabody Picture Vocabulary Test - Revised (PPVT -R; (Dunn & Dunn, 1981) was used to measure children's receptive vocabulary and has been used as a proxy for child IQ in a number of research studies (e.g., Bigler & Liben, 1992). The PPVT-R has been shown to correlate with other measures of general cognitive ability, such as the Stanford Binet (Alpeter, 1985). The instrument consists of 175 items of increasing difficulty, organized as "plates" containing four pictures per plate. Participants are asked to choose the picture that corresponds to the stimulus word from the four response options. The measure has adequate internal consistency as measured by split-half reliability ($r = .67 - .88$) and has been shown to correlate with other measures of language ability (Dunn & Dunn, 1981).

    The Parent Problem Solving Instrument (PPSI; Wasik, Bryant & Fishbein, 1981) (Appendix) was used to assess maternal social problem solving skill. This instrument is an open-middle test (also

known as a means-end assessment), which provides the beginning and end of a parenting scenario

and asks the examinee to create a story to connect the two. Means-end assessments are commonly

used measures of social problem solving skill in adults and adolescents (D'Zurilla & Nezu, 1999;

McMurran & McGuire, 2005; Spivack, Platt & Shure, 1976). The PPSI is comprised of 10 typical

childrearing scenarios (e.g., child throwing a tantrum in the store) presented in story form. Mothers

are provided with the beginning and end of a story and asked to provide an appropriate middle linking

the two. Responses are recorded verbatim and later coded by raters who were blind to study

hypotheses and maternal demographic information. Mothers' responses to the social scenarios

received four summary scores, three of which were used to measure maternal problem solving ability

in the present study: (a) the number of categories of solutions, (b) the number of elaborated solutions,

and (c) the number of irrelevant responses. A solution is a response that meaningfully connects the

beginning of the story given with the end of the story given. The number of categories is the number

of different solution categories offered by the parent in her response to the presented scenarios and

serves as an index of breadth of responses. Elaborated solutions are either a repeat of a previously

given solution with slight variation, or a more detailed solution (e.g., to calm a child down, "Give him

a cookie." and "Give him candy." are both examples of giving the child a treat). An irrelevant

response is one that does not meaningfully connect the beginning of the story to the end of the story

(i.e., does not solve the problem). In prior studies, the number of categories and number of elaborated

solutions have differentiated maltreating mothers from comparison mothers (Azar et al., 1984), and

mothers of infants with failure to thrive from mothers of healthy infants (Robinson, Drotar & Boutry,

2001). Inter-rater percent agreement was coded as part of a previous study and ranged from 94 to

100%.

The Preschool Interpersonal Problem Solving Test (PIPS; Shure & Spivack, 1974)

(Appendix) was used to assess child problem solving skill. Children are read a minimum 7 peer-related dilemmas (in which one child wants to play with another child's toy) and 5 mother-related dilemmas (in which a child has damaged mom's property). Visual aids are used to assist in the telling of the hypothetical dilemmas (i.e., picture of the toys and the hypothetical children in the child dilemmas for peer stories; picture of a broken item belonging to the mother in mother stories and picture of a child and a mother). Children are given the same dilemmas in multiple stories – one story at a time – varying the object involved (e.g., the other child is playing with a shovel or a swing) and asked to come up with different ways to solve each problem. If children continue to provide relevant solutions through the final story of the section (story 7 for peer stories, and story 5 for mother stories), the experimenter offers additional stories until the child can no longer provide new, relevant solutions. This procedure is used to reach the ceiling of the number of solutions children are able to provide. Responses are recorded verbatim and later coded by raters who are blind to study hypotheses, demographic information and social problem solving skill level. Children's responses are coded for the following: (a) number of alternative solutions (a measure of breadth), (b) number of repetitions of previous relevant solutions, and (c) irrelevant responses (i.e., responses that do not solve the problem). An alternative solution is one that would likely be successful in solving the problem and that the child has not previously stated (e.g., "asking" may be an appropriate solution in two problem scenarios, but would only be counted as a relevant response one time across child scenarios). Prior to use in the present analyses, each indicator was divided by the number of stories attempted by each child, thus creating a rate of response.

The number of alternative solutions a child provides on the PIPS has been shown to differentiate between children with behavioral and social competency concerns and children without

such concerns (Shure & Spivack, 1974) and to correlate with maternal child-rearing practices (Jones, Rickel & Smith, 1980). While previous studies have coded the number of repetitions and irrelevant solutions, they did not focus on them as independent indicators of child social problem solving. The present study uses the number of alternative solutions as the primary indicator for child social problem solving and repetitions and irrelevant solutions will be examined to expand the established methodology. Two raters scored one hundred percent of the PIPS protocols used in the current study. Inter-rater percent agreement was 92.86% for number of alternative solutions, 86.01% for the number of repeated solutions, and 80.06% for irrelevant responses.

Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) (Appendix) is a short 20-item self-report scale used to assess maternal depression symptomatology, including depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite and sleep disturbance. Each response is scored on a zero to three scale of frequency from "rarely" (0) to "all the time" (3) with a score greater than 16 being suggestive of depression. The CES-D is widely used as a measure of depression that has been shown to be a reliable measure for assessing types, number and duration of depressive symptoms (Knight, Williams, McGee, & Olaman, 1997; Radloff, 1977) has had high internal consistency in a number of studies (alpha > .85) (e.g., McIntyre, 2008; Radloff, 1977).

Results

Descriptive Analyses and Determination of Covariates

Means and standard deviations for all study variables are presented in Table 17. Statistical relationships between the demographic variables, dependent and independent variables were examined using Pearson correlations (for associations between continuous variables) and point-biserial correlations (for associations between a dichotomous and continuous variable) within the

normative and perpetrator samples independently (Table 3 and Table 4). Maternal social problem

solving was significantly positively associated with maternal IQ and maternal partnership status in

both samples. That is, mothers with a partner had stronger social problem solving than single

mothers in both samples. The relationship between some of the indicators of maternal social problem

solving and maternal IQ are consistent with previous findings linking maternal cognitive ability to

this social cognitive skill (Azar & Robinson, 2008). Further associations indicated that in the

perpetrator sample only, the lower the mother's Hollingshead social class, the lower her social

problem solving skills. Also, within this sample the better a mother's social problem solving skills

were the higher were her child's PPVT scores.

Associations were found between demographics and the second independent variable, number

of siblings that participant children have (Table 5). As one would expect, children with later birth

orders had mothers who were older and had more siblings. Further, in the perpetrator sample only,

the more years of education the mother had, the fewer children were in the family. This is consistent

with previous research showing decreased parity rates with increased education (Josipovec, 2007).

Finally, in the perpetrator sample, there was a trend in which non-white families had slightly more

children than white families.

Finally, the associations between demographic variables and the dependent variable, child

social problem solving, were examined (Tables 3 and 4). As would be expected, older children had

better social problem solving skills. Additionally, in the normative sample, poorer child social

problem solving was linked with lower levels of education, maternal unemployment, and lower SES,

which are well-documented risk factors in child development (Brown, Cohen, Johnson & Salzinger,

1998; Sameroff, Seifer, Baldwin & Baldwin, 1993).

Hypothesis 1: Maternal Social Problem Solving and Child Social Problem Solving

In order to examine the prediction that there would be a positive relationship between mother and child social problem solving, one-tailed Pearson correlations were computed between maternal (PPSI) Categories of Solutions, Elaboration of Solutions and Irrelevant responses, and child (PIPS) Alternative Solutions, Repetitions of Solutions and Irrelevant Responses in the normative and perpetrator samples separately. Analyses were run with and without controlling for maternal IQ.

Contrary to prediction, in the normative sample, there were no significant associations between maternal problem solving and total child problem solving (Table 6). To examine whether the content of the problem the child was faced with affected the inter-generational associations found (i.e., dilemma with peer or mother) the relationships were examined separately for the two types of stories. Even when examined by dilemma, there were no significant inter-generational correlations between mother and child social problem solving in the normative sample with or without controlling for maternal IQ.

In the perpetrator sample, however, there was one significant one-tailed Pearson Correlation between maternal PPSI and overall child PIPS scores both with and without controlling for maternal IQ. This was seen between Maternal Elaborations and Child Total Repetitions ($r = .27, p < .05$) (Table 7). When the type of problem was examined (i.e., problems with a peer or mother), there was a significant positive association between Maternal Categories and Child Repetitions in Maternal stories ($r = .33, p < .05$). However, when maternal IQ was controlled, all associations failed to reach significance.

In sum, Hypothesis 1 was not supported in the normative sample. However, in the perpetrator sample, Hypothesis 1 received some support between Maternal Elaborations and Categories and

Child Repetitions when IQ was not controlled. All of the findings in the perpetrator sample, however, became non-significant once IQ was controlled.

Hypothesis 2: The Number of Siblings and Child Social Problem Solving

In order to examine the hypothesis that as the number siblings in the home increased so would child social problem solving skills, one-tailed Pearson correlations between the number of siblings and the three child social problem solving indicators were completed. As predicted, there were significant, positive associations between child alternative solution generation (ASG) and the number of siblings in both the normative and the perpetrator samples (Table 8).   There were no significant findings between the number of children and repeated solutions or irrelevant responses in either sample.

The association between the number of siblings and children's problem solving skills on peer and mother problems were also examined separately. In the normative sample, the number of siblings was significantly, positively correlated with child ASG for both peer and mother stories. In the perpetrator sample, however, the number of siblings was correlated with child ASG only in the mother stories and not significantly correlated in the peer stories. There were no findings on the two other indicators of child social problem solving, Child Repetitions and Child Irrelevant Responses, in either sample.

In sum, as predicted, the number of siblings in the home was significantly, positively associated with child alternative solution generation in both the normative and perpetrator samples. In the perpetrator sample, this association varied in strength when the type of problem was considered, only achieving significance when children were solving dilemmas involving mothers. In both samples, there were no associations between the number of siblings and the two other child social problem solving indicators: Repeated Solutions or Irrelevant Responses.

Hypothesis 3: Prediction of Siblings beyond the Prediction of Maternal Social Problem Solving

Whether the number of siblings would continue to be positively associated with child social problem solving even after variance due to maternal problem solving was removed was examined via hierarchical regression. Three regressions (one for each of the child social problem solving indicators) were run, first without any control variables, and then again controlling for maternal IQ (Tables 9 through 12). In the first set of analyses, the three indicators of maternal social problem solving were entered into the first block, and the number of siblings was entered into the second block. When the IQ was examined in the second set of analyses, it was entered into the first block, the maternal problem solving variables were entered into the second block, and the number of siblings was entered into the third block.

The non-significant associations in Hypothesis one determined that maternal social problem solving would not significantly predict child skill in the normative sample. Though not significant, it is possible that the maternal social problem solving variables could suppress the effect of the number of siblings or vice-versa. Therefore, the regression was run despite the lack of significance expected in the first block.

In the normative sample, maternal problem solving did not significantly predict any of the three child social problem solving variables with or without controlling for material IQ (Tables 9 and 10). When the number of siblings was added, it did not significantly predict child social problem solving for any of the three regressions. However, there was a trend wherein the Number of Siblings explained an additional 7% of variance in Child ASG beyond maternal PPSI ($\beta = .26$, $p < .10$, $\Delta R^2 = .07$) (Table 9) and this trend was also found when maternal IQ was controlled ($\beta = .27$, $p < .10$, $\Delta R^2 = .07$) (Table 10).

These findings were similar in the perpetrator group (Tables 11 and 12). Maternal social problem solving did not significantly predict child social problem solving for any of the three child social problem solving variables with or without controlling for maternal IQ. Further, the regression did not significantly predict child social problem solving even after the number of siblings was added. However, there was a trend wherein the Number of Siblings explained an additional 7% of variance in child ASG beyond maternal PPSI ($\beta = .27$, $p < .10$, $\Delta R^2 = .07$) (Table 11), and this same trend was found when maternal IQ was controlled ($\beta = .27$, $p < .10$, $\Delta R^2 = .07$) (Table 12).

In summary, there were no significant findings supporting the prediction that the number of siblings would predict variance even after controlling for maternal social problem solving. However, there were trends for small effects in both samples, suggesting that the number of siblings may explain additional variance beyond maternal PPSI for child ASG. There were no findings for child Repetitions or child Irrelevant Solutions.

Hypothesis 4: Interaction between Maternal Social Problem Solving and Siblings

Finally, the prediction that the number of siblings would moderate the association between maternal social problem and child social problem solving was examined via hierarchical linear regression. All variables were centered by sample and the cross products of the three maternal social problem solving variables and the number of siblings were calculated. These cross products were entered into the final step of the hierarchical regression explained in Hypothesis 3 (Tables 9 through 12). The analysis was completed for each of the child social problem solving variables with and without controlling for IQ.

It was hypothesized that there would be a significant "buffering interaction" (Cohen, Cohen, West & Aiken, 2003) wherein the prediction of mother skill to child skill would be weaker for children with more siblings. Due to the lack of significant prediction of child social problem solving

by maternal social problem solving, it was not possible to test the hypothesis that the association was decreased by the presence of siblings. Nonetheless, the analyses were completed to test for an interaction effect.

In the normative sample, there were no significant effects, and the number of siblings did not interact with any of the maternal social problem solving variables in the prediction of child social problem solving (Tables 9 and 10). In the perpetrator sample, however, there was a significant interaction between maternal elaborations and the number of siblings ($\beta = 2.24$, $p = .04$, $\Delta R^2 = .11$) (Table 11) in the prediction of child alternative solutions. This interaction remained significant after controlling for maternal IQ ($\beta = 2.37$, $p = .04$, $\Delta R^2 = .12$) (Table 12). Though the interactions were significant at the variable-level, the third step failed to reach significance in either of the regressions, likely due to limitations in the degrees of freedom ($df = 40$).

To explore this trend further, the analyses for the perpetrator sample were run removing the non-significant maternal predictor variables to increase the degrees of freedom (Table 13). As was expected, the final step in the regression was significant ($\Delta R^2 = .11$, $p = .038$). Specifically, there was a significant interaction between the number of siblings in the home and the number of maternal elaborations ($\beta = 2.05$, $p = .03$, $\Delta R^2 = .09$). The interaction remained significant after controlling for maternal IQ ($\beta = 2.30$, $p = .02$, $\Delta R^2 = .11$).

In order to examine the nature of the significant moderation, the test of simple slopes was used (Aiken & West, 1991; Preacher, Curran & Bauer, 2006). First, the conditional regression lines were plotted. Because the variables had been centered, the conditional values of the moderator were chosen to be 0, 1 and -1 (the mean, and one standard deviation above and below the mean). Through visual examination of the plot (Figure 1), it is evident that Hypothesis 4 was not supported. In fact,

contrary to hypothesis, as the number of siblings increased, the association between maternal

elaborations and child alternative solutions increased.

Figure 1. *Simple Slopes Analyses of the Sibling Moderation of the Association between Maternal*

Elaborated Solutions and Child Alternative Solution Generation in the Perpetrator

Sample

Next, the significance of the simple slopes was examined to determine whether the slopes of

the lines differed from zero. Both slopes of the line representing the group of children with a high

number of siblings (i.e., one SD above the mean of siblings) ($t = 4.58$, p < .000) and the line

representing children with an average number of siblings ($t = 11.16$, $p < .000$) were significantly

different from zero. However, the line representing children with few siblings (i.e., one SD below the

mean number of siblings) was not significantly different from zero ($t = .063$, $p = 0.54$). This indicates

that as the number of siblings increase, the association between mother and child social problem solving skill becomes stronger.

In sum, Hypothesis 4 was not supported, though a significant interaction was found in the perpetrator sample that was contrary to what was predicted. Specifically, there was a significant interaction between maternal elaborations and the number of siblings predicting child alternative solutions, indicating that the more siblings a child has, the stronger the mother-child association is. There were no further moderation effects in either sample.

Post Hoc Exploratory Analyses

Given the few findings between maternal problem solving and children's problems solving, exploratory analyses were conducted to examine other contextual variables that may influence maternal problem solving and children's development of problems solving to enhance the interpretation of findings. The relationships between perpetration status, maternal social problem solving skill, child social problem solving skill and context variables consistent with the theoretical foundation of the present study were examined. The specific context variables included maternal depressive symptomatology, single vs. partnered mothers, and hours the child spends in daycare and out-of-home care. These variables were examined across the two samples via independent samples T-tests and associations within samples between context variables and key study indicators were examined via two-tailed Pearson Correlations.

Mothers in the perpetrator group had significantly higher levels of depressive symptomatology than mothers in the normative group ($t\,(100) = -4.33$, $p = .00$). In the normative group, maternal depression was not related to any maternal social problem solving indicator, though it was significantly positively associated to the number of irrelevant solutions provided by the child in peer stories (Table 15). In the perpetrator sample, however, increased maternal depression was

significantly associated with increased maternal elaborations ($r = .41$, $p < .001$), increased total child repetitions ($r = .35$, $p < .01$), and increased child repetitions in mother stories ($r = .32$, $p < .01$) (Table 16). It is noteworthy that the means of both groups on the measure of depression were greater than the cut-off for a potential clinical level of depression (Radloff, 1977) (Table 14).

Hours in day care and out-of-home care were also examined. Day-care is typically a formal care environment (i.e., Head Start), whereas total out-of-home care can include informal care networks of family, friends and neighbors. In comparing samples, children of perpetrating mothers spent more hours in day care (t (96) = -3.81, $p = .00$) and total the care of others (t (98) = -3.30, $p = .00$) than children of normative mothers (Table 14). There were no significant associations in the normative sample between study variables and daycare or out-of-home care. In the perpetrator sample, however, as the child spent more time in daycare, the number of total ($r = .32$, $p = .04$) and peer-related ($r = .33$, $p = .04$) child irrelevant solutions increased. Additionally, mothers who placed their children in out-of-home care for more hours had more elaborated solutions ($r = .58$, $p < .01$) and children who were cared for out of the home for more hours had more alternative solutions in the mother stories ($r = .39$, $p < .01$).

Finally, a two-way ANOVA (sample by single- vs. dual-parent status) was completed comparing maternal social problem solving and child social problem solving (Table 18). There were no significant main effects or interactions in child social problem solving. However, there were two significant main-effects for maternal problem solving by parent-status. Mothers with a partner offered more categories (F (1, 100) = 6.50, $p = .01$), and non-partnered mothers offered more irrelevant responses (F (1, 100) = 8.74, $p = .004$). There was also a trend in which partnered mothers had more elaborated solutions than non-partnered mothers (F (1, 100) = 3.02, $p = .09$). In the normative sample, there were no significant differences in elaborations between partnered and single

mothers, however, partnered mothers offered significantly more categories means than single mothers

$(F (1, 100) = 6.50, p = .01)$.

Discussion

The current study examined the intergenerational link between maternal social problem solving skill and preschool-aged child social problem solving skill as well as the association between the number of siblings and child social problem solving skill. Given the theoretical foundation of the present project (Bandura, 1986; Vygotsky, 1978), and previous research (e.g., Cole, et al., 2007; Dodge, Bates, Pettit, Valente, 1995; Spivack, Platt & Shure, 1976), it was hypothesized that there would be a positive relationship between maternal skill and child skill. These theory-based mechanisms (i.e., social learning and scaffolding) were extended to the presence of siblings in the home. It was hypothesized that siblings would serve as additional agents of social learning, practice, and instruction, and therefore the number of siblings would be positively associated with increased preschooler social problem solving skill. Finally, the interaction between the mother-child dyad and siblings was examined to more fully capture the dynamic workings of a family system (Carpendale & Lewis, 2006; Minuchin, 1985). It was hypothesized that the direct association between maternal and preschooler child social problem solving would decrease as the number of siblings in the home increased due to increased diversity in models and teachers. That is, siblings would serve as a "buffer" (Cohen, Cohen, Aiken & West, 2003) between mother and child social problem solving skill.

The Association between Maternal and Child Social Problem Solving

The associations found between maternal and child social problem solving lent partial support to the hypothesis that there are positive associations between social problem solving skills across generations. Contrary to hypothesis, there were no significant associations in the normative sample between mother and child social problem solving. However, there was some support for the hypothesis in the perpetrator sample, in which child repetition of social solutions was positively

associated with maternal breadth of solutions and maternal detail and expansion of solutions. However, the typical indicator of preschooler social problem solving, child alternative solution generation (ASG), was not associated with mother skill in either sample. The lack of findings in the normative sample, along with the presence of findings in a lower-level social cognitive tasks (i.e., repetition of a solution) suggest that the differences observed between samples in the association of maternal and child social problem solving skill varies with different levels of familial risk (i.e., presence or absence of maternal abuse and/or neglect) and that this variation may be due to differences between maltreating and non-maltreating families in mother-child interaction and the broader family environment.

Maltreated children are underdeveloped in a number of domains including cognitive functioning, non-social problem solving, and emotion regulation (Azar, Barnes & Twentyman, 1988; Egeland, Sroufe & Erickson, 1983; Robinson, Morris, Heller, Scheeringa, Boris & Smyke, 2009; Trickett, 1993). Thus, the development of social problem solving and sensitivity to contextual input, including parental scaffolding, may also be delayed. Successful social problem solving requires a number of higher-order cognitive abilities including perspective taking, working memory, attentional control, and set shifting (Azar & Robinson, 2008; Landry, Smith & Swank, 2009). Landry, Smith and Swank (2009) found that verbal scaffolding by parents was predictive of children's increased verbal ability at age four and that this enhanced verbal ability was predictive of greater executive functioning (EF) at age six, suggesting a developmental progression of the association between child skill and parental input. In the present study, Alternative Solution Generation (ASG), the hallmark of child social problem solving assessment (e.g., Duman & Margolin, 2007; McDowell, et al., 2002; Spivack, Platt & Shure, 1976), was not associated with mother skill. This finding, in concert with the under-development of maltreated children, suggests that the limited findings of the present study may

be due to the developmental appropriateness of the measure of social problem solving for young low-SES children. That is, the association between child and parent social problem solving in high-risk preschool samples may be clearer if measures of precursor social and cognitive skills were examined. In sum, alternative Solution Generation (ASG), the hallmark of child social problem solving assessment (e.g., Duman & Margolin, 2007; McDowell, et al., 2002; Spivack, Platt & Shure, 1976), does not appear to be the most developmentally-appropriate measure of social problem solving skill for a maltreating population and may account for the dearth of associations observed in the present study.

Trends were also seen between *deficits* in maternal and *delays* child social problem solving skill in the perpetrator sample only. That is, as the number of irrelevant solutions given by mothers increased, so did the irrelevant responses offered by the children. However, *skills* and *strengths* between generations were also associated as was seen in the association between child repetition of solution and mother social problem solving skill. This association in strength may be due to effective maternal scaffolding. The most effective form of scaffolding depends on the form of delivery and the child's ability level. Contingency and timing of parental elaborations during non-social problem solving have been found to be key in the effectiveness of parental scaffolding (Bibok, Carpendale & Muller, 2009). In their study, Bibok and colleagues examined young children during a puzzle task and measured contingent elaborative and directive utterances that mothers directed towards their children. They found that children's ability to shift attention and complete the puzzle task was related to mother's contingent elaborative, but not contingent directive statements. Thus, the form of scaffolding that was most effective was appropriately timed elaborations as opposed to directives. In an interpretation of this finding, Carlson (2009) argues that elaborative utterances may be a more important target of study than directives for understanding the association between maternal teaching

behaviors and child cognitive skill. This assertion is supported by the present finding that the number and the detail of maternal solutions (i.e., categories and elaborations) are linked to children's repetition of solutions and suggests that social problem solving *strengths*, or the ability to solve social problems, are associated across generations in a high-risk sample. The deficit/delay model (i.e., maternal social cognitive deficits associated with child social cognitive underdevelopment) is well known to clinical and intervention research, and is consistent with the behavioral research linking maternal violent behavior (including maltreatment) to child social information processing deficits (e.g., Fite et al., 2008; Goodman, Barfoot, Frye, & Belli, 1999; Taft, Schumm, Marshall, Panuzio & Holtzworth-Monroe, 2008; Teisl & Cicchetti, 2008). However, the present study's skill-based orientation suggests that a focus on the transmission of skill, as well as delay or deficit, may be beneficial, especially in a high-risk population where deficits are more salient than assets. The strongest associations within this sample were seen between mother and child *ability* to state and expand upon appropriate solutions. Thus, a strength-based focus upon the processes underlying the child development within even the highest risk families may help to highlight for researchers, practitioners and even families themselves, that there exist important social cognitive strengths that can be promoted across generations.

Maternal IQ: Might Individual Differences account for the Mother-Child Association?

The individual-difference perspective was examined in the present study in a number of ways including the use of a normative sample and a perpetrator sample. Access to this unique sample prompted additional questions regarding the applicability of the present study's inter-generational hypotheses to mother-child dyads in high levels of familial risk. As mentioned previously, differences in perpetration status is a broad differentiation that likely encompasses a number of familial risk and protective factors for child development generally and the specific development

social problem solving skill. Intrapersonal maternal risk and proactive factors that appeared to affect the findings of the present study include, but are not limited to, maternal IQ (associated years of education) and maternal mental health.

Parental IQ has been a topic of interest to developmental and child-focused researchers for many years (e.g., Sameroff, Seifer, Baldwin & Baldwin, 1993). In the present study, maternal IQ played an important role in the cross-generational associations between mother and child skill. That is, the associations that were seen in the perpetrator sample prior to controlling for IQ failed to reach significance once maternal IQ was controlled. A possible explanation of this finding is that the social problem solving assessment in the perpetrator sample may be a proxy for another cognitive ability, such as executive functioning or verbal intellectual functioning, which is also captured by years of education. The social problem solving assessment is answered in narrative, which, given the links between verbal ability and general cognitive ability (Sattler, 2008), may be capturing verbal cognitive ability in this at-risk sample. Additionally, maternal IQ and education was significantly positively associated with maternal social problem solving in the perpetrator sample. In a sample of high-risk impoverished families, Turkheimer, Haley, Waldrom and D'Onofio (2003) found that shared environment accounts for almost all of the heritability of IQ (which is almost exactly the opposite in lower-risk families). This suggests that the environmental hypothesized to mediate the development of higher-order social problem solving skills (i.e., modeling and scaffolding of children by family members) may be mediating lower-level cognitive processes, such as verbal IQ and EF. Additionally, the associations between mother and child social problem solving skill found in the perpetrator sample may be strongly influenced by other cognitive processes not tapped by our problem solving measure or by other intra personal factors like maternal mental health.

The minimal associations found between the social problem solving skills of mothers and their children may also be due to maternal characteristics that affect the quality of mother-child interactions. Maternal elaborations have a unique relationship with maternal depression and appear to capture more than an easily categorized protective or risk factor. In the perpetrator sample, maternal elaborations are positively associated with child social problem solving skill and maternal IQ, suggesting that the detail a mother provides while solving social problems may be specifically beneficial to the preschool-aged child in the maternal perpetrator sample. However, in the perpetrator sample, maternal elaborations are also significantly positively associated with maternal levels of depression, which is a known risk factor in child development. Mothers in both samples were above the suggested cut-off for depressive pathology (Radloff, 1977). The high levels of depression across samples could account for the low associations between mother and child social problem solving skills. Parenting differences between mothers with and without depressive symptoms have been well-documented and have been shown to be associated with problems in the family system, including negative interaction with and/or disengagement from the child (Cummings & Davies, 1994). In fact, Jaffee, Caspi, Moffitt, Polo-Thomas and Taylor (2007) found that maternal depression was a significant predictor of decreased child resilience[1] in a maltreated sample.   The lower levels of engagement with the target child is consistent with the associations between social problem solving skill and the number of siblings as contrasted with the lack of association between maternal and child social problem solving. That is, as a mother withdraws from interactions with her child her association with child skill decreases. However, despite maternal disengagement siblings will likely continue to engage and to develop similar social problem solving strategies.

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[1] Resilience was defined as having experienced childhood maltreatment and having antisocial behavior scores in the typical range.

Further, it seems that despite the risks that coincide with maternal depression, maternal elaboration of social solutions is capturing a process that has a positive impact on transmission of the skill. Though the process is unknown, it may be that a mother who is depressed is slower in her interactions with her child and may perseverate on a single solution. This slow, repetitive process may be useful for a delayed child's skill acquisition.

In sum, maternal IQ, as well as associated maternal education, appears to have a different association with social problem solving across samples. Specifically, Maternal IQ was associated with all three maternal social problem solving indicators in the perpetrator sample, but only one in the normative sample. Further, when IQ was controlled, all significant associations were reduced to non-significance. This introduces the possibility that the associations between mother and child social problem solving skill found in the perpetrator sample may be strongly influenced by other cognitive processes not tapped by our problem solving measure (i.e. IQ or EF), or by other intrapersonal factors like maternal mental health.

Siblings and the Impact of the Internal Resources on the Family System

The present study also sought to examine the development of social problem solving within the broader context of the larger family system through a preliminary examination of the number of siblings in the family. Though siblings can be considered in a number of important ways, the present study examined the effect of the number of siblings on child social problem solving skill. The hypothesis that more siblings are associated with increased social problem solving skill was supported in both samples even when controlling for IQ, child age and child sex. However, the impact of siblings was seen in alternative solutions generation only and was not replicated in the number of repetitions of solutions or in the number of irrelevant responses. This stands in contrast to

the inter-generational bivariate associations between mother and child skill, wherein the only significant findings were seen in child solution repetition.

Associations were examined across children's responses to problems with peers and to problems with mothers (i.e., in different contexts). In the normative sample, there was a positive association between the number of siblings and the number of alternative solutions in both story contexts, suggesting that siblings are associated with increased breadth in social solutions with both peers and with caregivers. That is, there is an evenness in the potential influence of siblings across the domain of social problems that they encounter. In contrast, in the perpetrator sample siblings were only significantly associated with alternative solution generation in the mother stories, and not in the peer stories. One possible conclusion from this finding is that siblings may have a more positive impact on child social problem solving within the maternal context than within the peer context. This finding may be understood via theorizing within resilience literature that suggests that siblings may function as protective factors within risky family environments (Stormshak, Bellanti & Bierman, 1996). That is, siblings may model and teach other siblings how to solve problems with mothers because that is the most relevant to day-to-day life even though the quality of the solutions may not be as strong as what would be taught be an adult. Modeling and teaching regarding peer problems would be less prevalent in sibling-to-sibling problem solving narrative and, as will be discussed in detail later, the solutions learned within the home environment would be less applicable to environments out of the home. Additionally, hypervigilance to threat is a well-documented phenomenon among victims of child abuse (Pollak, Cicchetti, Hornung & Reed, 2000), thus the target child may be more attentive to mother-focused solutions given the salience of her threat. This transaction between the sibling modeling and teaching the more salient mother-solutions and the

target child being more aware of mother-related information may help to explain the pattern of associations found in the maltreatment sample.

Further, social learning theory has demonstrated that individuals are more likely to model their behavior after individuals that are more like themselves. Therefore, the stronger association between the number of siblings and child skill in mother-related problems, as compared with maternal social problem solving skill in general, could be a reflection of salience as well as time spent with the source of modeling, teaching and practice. Increased numbers of siblings means more exposure to people and models that are similar to the target child in age within the family context and as such, may offer a breadth of social solutions to the developing child. However, the power of social learning with the abusive or neglectful household may be limited to the strategies relevant to the maltreating environment. That is, the social strategies for survival within an abusive environment may be significantly different than those needed to maintain peer relationships, and thus the solutions learned within the home may only be relevant to the home. Thus, with children from abusive families are picking up additional solutions that are useful only within the most salient aspect of their social environment: the maternal perpetrator.

This limited applicability of social solutions from a maltreating home environment to other environments encountered by a child is seen in a clinical setting and reflected in theories of disordered family dynamics. For instance, coercion theory (Patterson, Dishion & Bank, 1986) captures a style of interaction that is successful in a specific environment. In this theory, the child learns that a powerful way to achieve a desired outcome (e.g., TV time) is by responding to the parent in a way that leads the parent to remove an undesired outcome (e.g., chores). The child engages in negative behavior at increasing levels of intensity (typically yelling or otherwise behaviorally escalating) until the child behavior becomes so aversive to the parent that the request is removed (i.e.,

cycle of negative reinforcement). Clinically, there is a frequent discrepancy between the solutions that are effective within the home and within the school (or other social environment). For instance, when the child who has successfully used coercive behavior in the home attempts to do the same in school, the behavior is met with teacher punishment and even peer rejection. In this way, the strategies learned in one environment do not translate to another environment.

Sibling Moderation of the Association between Mother and Child Problem Solving

The number of siblings a child has must be considered as part of the influence of an entire family system (Brody, 2004; Bronfenbrenner, 1979; Minuchin, 1985). The present study hypothesized that as the number of siblings increased, the direct association between mother and child social problem solving would decrease. This hypothesis was not supported. There was no moderation effect in the normative sample and in the perpetrator sample there was a moderation effect in the opposite direction of the hypothesis. That is, in the perpetrator sample, increases in the numbers of siblings were associated with a stronger association between mother and child skill.

Though contrary to the study hypothesis, the strengthening effect of siblings in the perpetrator sample can be understood within the theoretical frame of the project. That is, just as parents serve as models and teachers for the target child, they also serve as models and teachers for siblings. Therefore, the siblings may provide a set of solutions that is similar to the set provided by parents. Thus, the target child would be exposed to the same or similar solution content from multiple sources.

Though intergenerational associations between mothers and children were limited in the present study, this may be a reflection of the form of measurement used. The measurement of the cross-generational associations in present study was based upon number (ASG) and process (elaborations), not explicit content (i.e., a specific solution or type of solution). However, as has been suggested by other SIP researchers (e.g., Hadwin, Garner & Perez-Olivas, 2006; MacBrayer, Milich

& Hundley, 2003) it may be that the content of solutions (or other SIP processes) are associated across generations as opposed to the number. That is, the mother may model a type of solution that is then more likely to be modeled by a sibling as well (e.g., If you break your mother's vase, you would "fix it", which would increase the likelihood that a sibling would also model/teach "fix it" as a solution for their brother or sister). Another example would be if a mother provided four solutions to peer conflict (e.g., "talking to an adult", "asking", "hiding a broken object so that the person does not know" and "yelling at the other person") and the target child or sibling would offer only one of those four solutions (e.g., "asking"). In this scenario, there would be a little to no correlation between the number of solutions (as was found in the present study), but there would be an association between the content of that single solution. Therefore, while the process and quantity offered by the children does not appear to be associated with mother's process and qualitative, the content may be. If that were the case, the target children would be exposed to multiple family members suggesting the same or similar solutions to social problems.

In sum, siblings have both independent positive influence on child social problem solving and function within the family system to moderate the association between mother and child social problem solving skill. Further, the moderating effect of siblings varies by maternal perpetrator status. Specifically, the number of siblings only increases the association between mother and child social problem solving skill within the perpetrator sample.

Limitations

Although the current study makes a contribution to the literature regarding the development of child social problem solving and the protective qualities of siblings in risky environments, certain limitations must be acknowledged. First, though the sample was large in comparison to other studies of child maltreatment, it was not large enough to detect small effects (Murphy & Myors, 2004).

Thus, some of the more subtle findings may have remained uncovered. Further, given the large number of analyses in the present project, some of the findings may be due to chance. Though the Bonferroni correction was not used, the strongest findings have a probability of $p < .01$ and therefore the study's primary conclusions are considered minimally compromised.

Another limitation is the measurement of social problem solving. Maternal social problem solving was assessed via verbal response and child social problem solving was assessed in a laboratory setting also via verbal response. Both lab-based and verbally mediated assessments differ from in-vivo social problem solving skill. It may be that social problem solving would be better examined via behavioral observation of children and mothers' problem solving skill. In fact, some researchers are beginning to study social problem solving within groups of children and families using live teaching tasks (Davis-Unger & Carlson, 2008a, 2008b; Landry, Smith & Swank, 2009) to increase the ecological validity of the assessment.

Finally, the broader definition of the construct of preschooler social problem solving itself must be considered as a possible limitation of this and other social problem solving studies. The purpose of a social problem solving assessment is to capture the social competence of an individual. However, the means-end problem solving assessment and alternative-solution assessment require that an individual use a number of social information processes prior to reaching a successful response (e.g., identification of a problem, attention to the problem, schematic recall). A more focused examination of the mediating processes that comprise social problem solving may yield a clearer understanding of how strengths and deficits in this skill develop within the family. For instance, children's ability to identify a social problem, understand the perspective of others, or selectively attend to the problem in the midst of other social stimuli are processes that comprise the larger construct of social problem solving. Such examinations are currently in progress and are attempting

to link social competence to executive functioning to peer teaching (Davis-Unger & Carlson, 2008a, 2008b) and social competence in a school setting (Bierman & Huang-Pollock, project in progress). Investigations linking cognitive processes, such as EF, to adaptive outcomes provide more focused information about social cognitive processing across generations.

Finally, the data used for the present study are cross-sectional and do not provide definitive evidence on the direction of causality. Nonetheless, this study is the first step in examining what is thought to be a transactional relationship wherein mother skill affects child skill, and child characteristics affect maternal behavior (and thus transmission of skill). Examining this cross-sectional association helps to determine the focus of future longitudinal work on parental SIP processes and family characteristics that serve as risk factors or protective factors for young child social problem solving.

Future Directions

The present project was one of the first studies that has directly examined of the association between mother social problem solving skill and preschool-aged child social problem solving skill. Though this project extended the understanding of this association to include siblings and maltreatment status, there were a number of systemic and family factors that in that were not examined as part of this study. Exploratory analyses were completed to begin to examine the influence these factors child social problem solving. The findings from these analyses are presented below, as well as additional suggestions for future examination.

Partnership status and child skill.

Just as social learning and Vygotskian theories can be extended to siblings, so can they be extended to the presence of additional adult models in the family. In a home with two caregivers, it is likely that a child is exposed to more people, adult scaffolding, and thus a greater breadth of

solutions. This person could also provide additional opportunities for adult-adult interaction and parents' scaffolding of each other's skills (e.g., providing alternative solutions to childrearing situations).

In terms of partnership status, there were significantly more single-mother households in the perpetrator sample, and a higher percentage of partnered mothers in the normative sample. The low proportion of mothers in a relationship may be linked to a broader deficit in interpersonal functioning, a question that is currently under study (Azar NICHD R01 HD053713). That is, it has been argued that mothers who have deficits in parenting, such as is found in maltreatment samples, may also have deficits in other realms of their interpersonal lives (see Azar, 1986). Supporting this idea is that in this study, single mothers were found to be less competent social problem solvers than partnered mothers. This was especially true in the perpetrator sample wherein single mothers had significantly lower social problem solving skills than partnered mothers.

The present study found that the social problem solving skill of mothers, and not children, is related to the presence of another caregiver in the home, which points to a few possible implications. First, the lack of association between the presence of another caregiver and child social problem solving skill can be contrasted with the significant association between the number of siblings and child skill. A possible reason for lack of findings between partnership status may be limited variability in a dichotomous single/partnered categorization. Future studies may benefit from considering the amount of time spent with an additional caregiver, as was done in the present examination of hours in out-of-home care. Another possible reason for the lack of association between another caregiver and child social problem solving is the measurement of social problem solving itself. Previous research has found that fathers are important in the transmission of quality of the solutions, but have yet been shown to affect the quantity of solutions (McDowell, Parke &

Spitzer, 2002). Therefore, the measure used, which focuses upon quantity of solutions, may not correctly capture the developmental skill that is most influenced by fathers. Future study would benefit from examining both the number and quality of child solutions, which would allow for further study of the differential impact of fathers and mothers on characteristics of child social problem solving skill.

Partnership status also has a dynamic relationship with the amount a child repeats a solution as opposed to providing a breadth of solutions. In the normative sample children of partnered mothers had more repeated solutions, whereas in single-mother families children of perpetrator families had more repeated solutions. This negative association between the presence of a partner and child skill in the perpetrator sample could add greater clarity discussion above regarding the lack of association between child social problem solving and maternal partnership. In fact, this finding could suggest that single-parenthood is an asset in perpetrator families. That is, opposed to being an additional support, the presence of a partner could actually take away resources from the child, or even perpetrate against the child. In this case, the partner may represent increased risk and the absence of a partner may be a benefit.

Though this was only a preliminary examination of the impact of maternal partnership on the development of child social problem solving skill, it is evident that the association between the number of caregivers and child skill is worthy of further examination, especially in high-risk samples. Future studies should consider the impact of all caregivers on the development of child social problem solving, perhaps even non-parent caregivers (e.g., grandmothers). Further, because both child and adult development is affected by the presence of other adult(s) in the home, it is recommended that both adult-adult and adult-child interactions be observed to examine the extent of support or detriment of another adult caregiver to the development of child social problem solving.

Extra-familial resources.

The primary extra-familial support seen during preschool years is childcare out of the home, either in daycare agencies or informal care (e.g., neighbors or family members). Childcare is relevant for the present sample, as much of the recruiting took place in childcare centers targeting high-risk families. Therefore, the hours spent in daycare and total hours in out-of-home care were examined to inform future directions.

To begin, children of perpetrating mothers spent more in the care of others than children of normative mothers. This is to be expected given rates of social service intervention in maltreated populations and that daycare is a primary intervention for maltreated children (Azar, Barnes & Twentyman, 1986). Deficits in child social problem solving were actually found to increase with more hours in daycare. That is, as the number of hours that children spend in *day care* increase, the number of irrelevant solutions that the children provide also increases indicating a decrease in social problem solving skill. That day care placement is associated with worse performance may not be a reflection of the placement or breadth of exposure. Aside from the expected occupational demands on the single caregiver, a child may be placed into childcare by an external social service agency due to inadequacies of the home environment. Further, as Azar, Barnes and Twentyman (1988) noted maltreating parents may not be the best consumers of child care. These parents may only sporadically use the service, and likely have lower rates of participation in intervention than non-maltreating families. Thus, the negative association between hours in daycare and child social problem solving skill may be a reflection of the familial risk and not the out-of-home placement itself.

This is supported by looking at a related variable, the number of t*otal hours in out-of-home care*. Out-of-home care includes day care, but goes further to add informal care networks, such as

time with family or friends. Mothers that place their children in out-of-home care for more hours must have the social and interpersonal resources to establish this care. In fact, this study found that in the perpetrator sample, mothers who place their children out of the home for more hours have stronger social problem solving skills and have children with stronger skills. There are a number of possible reasons for this association. One is that mothers who locate and utilize childcare beyond need-based intervention are able to maneuver through and maintain a complex social support system, which would require strong social problem solving skills. Another is that mothers who place their kids in care for many hours a week may be mandated to do so, and thus may also be attending parenting classes that would focus upon solutions to parenting problems as they are presented in the assessment. Additionally, this could be tapping another variable that has been discussed as key to the etiology of child maltreatment – social support (Azar, 1986). That is, mothers who have respite care for their children also benefit from having social network, more assistance with care, and thus likely lower levels of stress. Future research and intervention should consider ways to increase at-risk mother's ability to locate naturalistic social support as well as social skills to best utilize this support in the care for their children.

Other directions for future intervention and research.

The findings from the present project indicate that family variables are related to preschool-aged children's social problem solving skill. Siblings are positive influences upon the development of social problem solving skill in families with and without a history of child maltreatment. However, in families with a history of child maltreatment, siblings were found to be most influential in mother-related problems and to affect the nature of the relationship between mother and child social problem solving skill. Siblings may, therefore, be an underutilized natural resource for children in high-risk families. Psychological interventions for families with abuse histories that focus

on building sibling support should be considered. Though care would need to be taken to limit the "parentification" of older siblings in such households, building naturalistic support systems within the family via positive sibling relationships would likely bolster within-family protective factors, and serve as a long-term benefit to children at risk. A few sibling-based interventions have been used in other areas such as disability and illness with moderate success (e.g., Lobato & Kao, 2002) and could inform sibling work in high-risk families.

In addition, more research is needed to examine the construct of social problem solving and how the component processes relate to real-world outcomes. Problem solving is defined in multiple ways, most of which rely on verbal self-report or story telling. This reliance upon expressive language ability confounds verbal ability with social problem solving skill. Further, identification of influential component processes of social problem solving, and their development can lead to targeted interventions, wherein caregivers are assisted in skills to support the developmentally-appropriate level of adaptive social cognitive development of children in their care. Additionally, examining the behavior of children, siblings, and parents would allow for a better understanding of how the observed social cognitive associations relate to family interaction patterns.

Conclusions

Developmental theory and research has highlighted importance of mother characteristics and mother-child interactions in the development of young child social and cognitive skills (Ainsworth, Blehar, Waters, & Wall, 1978; Azar, 1986; Bandura, 1986; Carpendale & Lewis, 2004). Additionally, social information processing research emphasized the importance of the capacity to solve social problems in the adaptive social functioning of both adults (Heppner, Reeder & Larson, 1983; McGuire, 2001) and children (Pettit, Dodge & Brown, 1988; Richard & Dodge, 1982; Spivack & Shure, 1974). Despite the acknowledgement of intrapersonal importance of social problem solving, there are few studies that have examined the development of social problem solving within a family context. This study examined the association between maternal social problem solving and preschool-aged child social problem solving while beginning to include a family systems perspective through the inclusion of siblings (Minuchin, 1985; Granic & Patterson, 2005). There was minimal support for the intergenerational hypothesis in a sample of normative low-SES dyads, possibly due to more salient influences in this population, such as minimal resources and low mother-child interaction. However, mother and child skill were associated within a sample of with a history of maternal child maltreatment, suggesting that maternal social problem solving has differential input across topographies of mother-child interaction. Siblings, however, were found to be influential in both levels of risk, though the exact nature of their impact varies. In environments of high risk, siblings may be most influential in the development of social problem solving strategies related to the salient maternal figure. Additionally, in the perpetrator sample, increased numbers of siblings were found to strengthen the association between mother and child social problem solving. Exploratory analyses indicated that maternal depression affected the mother-child association and suggested that future research examine the importance of single- versus dual-caregiver families, out-of-home

placement and social support. Overall, findings indicate that families who are at-risk due to limited

external resources or within-family abuse or neglect, are in particular need of support from the inside

out. Identification of the strengths within the family system, such as maternal mental health and

sibling supports, can inform such family-centered intervention.

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Appendix A: Tables

Table 1. *Demographic Information for the Normative Sample (n =56) and Maternal Perpetrator Sample (n = 48)*

	Normative Sample (n = 56) Mean (SD)		Perpetrator Sample (n = 48) Mean (SD)	
Sex[†4]	Female (n = 34)	Male (n = 22)	Female (n =21)	Male (n = 27)
Mother				
Age*[1]	28.11 (4.29)	30.73 (4.46)	28.16 (5.67)	30.09 (6.17)
IQ	87.85 (8.60)	85.50 (10.67)	82.71 (17.79)	83.11 (12.51)
Years of Education**[2]	12.0 (1.33)	12.32 (1.94)	11.38 (1.66)	10.59 (2.55)
Unemployment	26 (76.5%)	15 (68.2%)	17.5 (85.7%)	22 (81.5%)
# of siblings[†3]	2.41 (1.35)	3.09 (2.22)	2.76 (1.26)	3.44 (1.71)
Parental Status				
Dual Parent	20 (35.7%)	13 (23.2%)	6 (12.5%)	9 (33.3%)
Single Parent	14 (25%)	9 (16.1%)	15 (31.3%)	18 (37.5%)
Child				
Age	4.35 (.68)	4.51 (.57)	4.54 (.71)	4.54 (.57)
PPVT	94.88 (16.35)	86.50 (24.21)	86.52 (18.31)	84.00 (19.70)
Birth Order	1.50 (1.31)	2.00 (1.85)	1.85 (1.46)	2.08 (1.16)
Race[†5]				
White (non Hispanic)	26 (76.4%)	15 (68.2%)	17 (81%)	23 (85.2%)
Non White (African American, Asian American, Latino/a)	8 (23.5%)	7 (31.8%)	4 (19%)	4 (14.8%)
Socioeconomic Status (Hollingshead)*[6]	4.47 (.83)	4.09 (.87)	4.45 (.76)	4.69 (.47)

** $p < .01$; * $p < .05$; $^{†}p < .10$

[1]$F (1, 99) = 5.52, p = .02$ (Sex)
[2]$F (1, 99) = 8.97, p = .003$ (Sample)
[3]$F (1, 99) = 4.06, p = .05$ (Sex)
[4]$\chi^2 [1, N = 104] = 2.99, p = .06$ (Sex*Sample)
[5]$\chi^2 [1, N = 81] = 3.56, p = .06$ (Sex*Sample)
[6]$F (1, 99) = 4.24, p = .04$ (Sex*Sample)

Note only significant differences reported.
See Table 2 for complete two-way ANOVA and Chi-Squred findings (Sample by Sex)

Table 2.   *Two-Way ANOVA and Chi-Squared Analyses Examining Demographic Differences Sample by Sex*

	Normative vs. Perpetrator Sample	Sex (Male vs. Female)	Sample*Sex
Mother			
Age*	$F(1, 99) = .03, p = .84$	$F(1, 99) = 5.52, p = .02*$	$F(1, 99) = .04, p = .84$
IQ	$F(1, 99) = 2.05, p = .16$	$F(1, 99) = .095, p = .76$	$F(1, 99) = .41, p = .52$
Years of Education**	$F(1, 99) = 8.97, p = .003**$	$F(1, 99) = .29, p = .59$	$F(1, 99) = 1.88, p = .17$
Unemployment	$F(1, 99) = 1.68, p = .20$	$F(1, 99) = .62, p = .44$	$F(1, 99) = .04, p = .84$
# of siblings[†]	$F(1, 99) = 1.05, p = .31$	$F(1, 99) = 4.06, p = .05^†$	$F(1, 99) = .001, p = .98$
Parenting Status			
Dual Parent			$\chi^2[1, N = 48] = 1.76, p = .18$
Single Parent			$\chi^2[1, N = 56] = 1.30, p = .26$
Child			
Sex[†]			$\chi^2[1, N = 104] = 2.99, p = .06^†$
Age	$F(1, 99) = 1.84, p = .18$	$F(1, 99) = .08, p = .78$	$F(1, 99) = .85, p = .36$
PPVT	$F(1, 99) = 1.93, p = .17$	$F(1, 99) = 1.95, p = .17$	$F(1, 99) = .56, p = .46$
Birth Order	$F(1, 99) = .54, p = .47$	$F(1, 99) = 1.56, p = .21$	$F(1, 99) = .46, p = .64$
Race			
Caucasian[†]			$\chi^2[1, N = 81] = 3.56, p = .06^†$
Non-Caucasian			$\chi^2[1, N = 23] = .02, p = .61$
Socioeconomic Status [†] *	$F(1, 99) = 3.70, p = .06^†$	$F(1, 99) = .2123, p = .65$	$F(1, 99) = 4.24, p = .04*$

** $p < .01$; * $p < .05$; [†]$p < .10$

Table 3. *Correlations between Demographic Variables, Maternal PPSI and Child PIPS in the Normative Sample*

	Maternal PPSI			Child PIPS		
	Maternal Categories	Maternal Elaborations	Maternal Irrelevant	Child ASG	Child Repetitions	Child Irrelevant
Mother						
Age	.09	.13	-.12	.32*	.02	.21
IQ	.33*	-.00	-.22	.09	-.11	-.07
Years of Education	.22 †	.09	-.13	.42**	-.04	-.14
Unemployment	.04	.10	-.03	-.10	-.34*	-.29*
Parental Status (single-parent/dual-parent)	.14	-.14	-.30*	.07	-.02	-.18
Child						
Age	.24†	.02	-.25†	.33*	.29*	.00
PPVT	.11	.14	-.11	.20	-.20	-.40**
Birth Order	.16	-.02	-.12	.21	.04	.06
Race (white, non-white)	-.04	-.03	.08	-.03	.20	.25 †
SES	-.15	.05	.16	-.36*	.11	-.03

** $p < .01$; * $p < .05$; $^{\dagger}p < .10$

Table 4. *Correlations between Demographic Variables, Maternal PPSI and Child PIPS in the Perpetrator Sample*

	Maternal PPSI			Child PIPS		
	Maternal Categories	Maternal Elaborations	Maternal Irrelevant	Child ASG	Child Repetitions	Child Irrelevant
Mother						
Age	-.06	.01	.04	.25†	.02	.12
IQ	.51**	.41**	-.53**	.03	.31*	-.19
Years of Education	.31*	.27†	-.33*	-.23	.08	-.20
Unemployment	.22	.10	-.16	-.16	.02	-.01
Parental Status (single-parent/dual-parent)	.32*	.37**	-.27 †	.05	.11	.05
Child						
Age	-.03	.26†	.00	.47**	.29*	-.08
PPVT	.35*	.21	-.31*	.24	.21	-.19
Birth Order	-.14	.03	-.05	.12	.10	-.01
Race (white, non-white)	-.04	.08	.16	-.05	.08	.03
SES	-.30*	-.20	.30*	.10	.07	-.12

** $p < .01$; * $p < .05$; $^{\dagger}p < .10$

Table 5. *Correlations between Demographic Variables and the Number of Siblings in the*
Normative Sample and Perpetrator Sample

	Number of Siblings	
	Normative Sample	Perpetrator Sample
Mother		
Age	.45*	.55**
IQ	-.02	-.07
Years of Education	-.04	-.58**
Unemployment	-.10	-.08
Parental Status (single-parent/dual-parent)	.10	.08
Child		
Age	.21	.18
PPVT	-.20	-.05
Birth Order	.90**	.61**
Race (white, non-white)	-.07	-.26†
SES	-.08	.03

** $p < .01$; * $p < .05$; $^\dagger p < .10$

Table 6. *Pearson Correlations between Child Social Problem Solving and Maternal Social Problem Solving in the Normative Sample with and without Controlling for Maternal IQ*

		PPSI		
		Maternal Categories r ($r_{Controlling IQ}$)	Maternal Elaborations r ($r_{Controlling IQ}$)	Maternal Irrelevant r ($r_{ontrolling IQ}$)
PIPS Total (N = 56)	Child ASG	.16 (.14)	.06 (.07)	-.15 (-.13)
	Child Repetitions	-.11 (-.08)	.02 (.02)	.04 (.02)
	Child Irrelevant	.02 (.05)	.10 (.10)	.02 (.002)
PIPS Peer Stories (N = 55)	Child ASG	.20[†] (.17)	.13 (.13)	-.14 (-.12)
	Child Repetitions	-.15 (-.12)	-.01 (-.01)	.11 (.09)
	Child Irrelevant	.12 (.18)	.10 (.10)	-.08 (-.11)
PIPS Mother Stories (N = 52)	Child ASG	.16 (.17)	.03 (.03)	-.16 (-.17)
	Child Repetitions	-.03 (.03)	.15 (.14)	-.07 (-.11)
	Child Irrelevant	-.06 (-.10)	-.02 (-.02)	.07 (.09)

** $p < .01$; * $p < .05$; †$p < .10$

Table 7. *Pearson Correlations between Child Social Problem Solving and Maternal Social Problem Solving in the Perpetrator Sample with and without Controlling for Maternal IQ*

		PPSI		
		Maternal Categories r ($r_{Controlling IQ}$)	Maternal Elaborations r ($r_{Controlling IQ}$)	Maternal Irrelevant r ($r_{ontrolling IQ}$)
PIPS Total (N = 56)	Child ASG	-.06 (-.09)	.07 (.06)	.02 (-.04)
	Child Repetitions	.24[†] (.10)	.27* (.17)	-.10 (.07)
	Child Irrelevant	-.16 (-.07)	-.21[†] (-.14)	.23[†] (.15)
PIPS Peer Stories (N = 55)	Child ASG	-.09(-.07)	.05 (.05)	.08 (.07)
	Child Repetitions	.12 (.05)	.22[†] (.17)	-.05 (.04)
	Child Irrelevant	-.14 (-.12)	-.17 (-.15)	.21[†] (.20[†])
PIPS Mother Stories (N = 52)	Child ASG	-.01 (-.07)	.03 (-.01)	-.06 (-.01)
	Child Repetitions	.33* (.16)	.22[†] (.07)	-.19 (.03)
	Child Irrelevant	-.20[†] (-.07)	-.18 (-.07)	.21[†] (.08)

** $p < .01$; * $p < .05$; †$p < .10$

77

Table 8.   *Correlations between Child Social Problem Solving and the Number of Children in the Normative and Perpetrator Samples with and without Controlling for Maternal IQ*

		Number of Children	
		Normative Sample r ($r_{Controlling\ IQ}$)	Perpetrator Sample r ($r_{Controlling\ IQ}$)
PIPS Total (N = 48)	Child ASG	.28* (.28*)	.27* (.27*)
	Child Repetitions	.13 (.13)	.00 (.02)
	Child Irrelevant	.09 (.09)	.05 (.04)
PIPS Peer Stories (N = 48)	Child ASG	.25* (.26*)	.15 (.14)
	Child Repetitions	.12 (.12)	-.10 (-.09)
	Child Irrelevant	.09 (.09)	.13 (.13)
PIPS Mother Stories (N = 45)	Child ASG	.30*(.30*)	.31* (.32*)
	Child Repetitions	.12 (.12)	.12 (.15)
	Child Irrelevant	.09 (.09)	-.08 (-.10)

Table 9. *Summary of Hierarchical Regression for Maternal Social Problem Solving, Number of Children and the Interaction between Maternal Social Problem Solving and the Number of Children Predicting Child Social Problem Solving for the Normative Sample*

Predictor	Child ASG ΔR^2	Child ASG β	Child Repetitions ΔR^2	Child Repetitions β	Child Irrelevant ΔR^2	Child Irrelevant β
Step 1						
Maternal Categories	.03	.11	.02	-.15	.01	.04
Maternal Elaborations		.01		.06		.11
Maternal Irrelevant		-.07		-.04		.08
Step 2						
Maternal Categories	.07†	.07	.02	-.93	.01	.03
Maternal Elaborations		.02		.46		.11
Maternal Irrelevant		-.06		-.03		.08
Number of Children		.26†		.15		.10
Step 3						
Maternal Categories	.03	.00	.01	-.20	.01	.06
Maternal Elaborations		.03		.07		.11
Maternal Irrelevant		-.08		-.04		.09
Number of Children		.31		.22		.00
Mom ASG*Num Child		-.20		-.03		.04
Mom Elab* Num Child		-.11		.08		-.12
Mom Irr*Num Child		-.06		.05		-.07
Total R^2	.13		.05		.04	
n	56		56		56	

** $p < .01$; * $p < .05$; $^\dagger p < .10$

Table 10. *Summary of Hierarchical Regression for Maternal Social Problem Solving, Number of Children and the Interaction between Maternal Social Problem Solving and the Number of Children Predicting Child Social Problem Solving for the Normative Sample (Controlling for Maternal IQ)*

Predictor	Child ASG		Child Repetitions		Child Irrelevant	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1						
Maternal IQ	.01	.09	.01	-.11	.01	-.07
Step 2						
Maternal IQ	.02	.05	.01	-.08	.01	-.07
Maternal Categories		.09		-.12		.07
Maternal Elaborations		.01		.05		.10
Maternal Irrelevant		-.07		-.04		.08
Step 3						
Maternal IQ	.07†	.07	.02	-.07	.01	-.07
Maternal Categories		.05		-.15		.06
Maternal Elaborations		.03		.06		.10
Maternal Irrelevant		-.06		-.033		.09
Number of Children		.27†		.15		.09
Step 4						
Maternal IQ	.04	.14	.01	-.08	.01	-.07
Maternal Categories		-.06		-.16		.09
Maternal Elaborations		.04		.06		.10
Maternal Irrelevant		-.08		-.04		.09
Number of Children		.33†		.21		-.01
Mom ASG*Num Child		-.23		.02		-.06
Mom Elab* Num Child		-.14		.09		-.10
Mom Irr*Num Child		-.05		-.04		-.07
Total R^2	.14		.05		.04	
n	56		56		56	

** $p < .01$; * $p < .05$; † $p < .10$

Table 11. *Summary of Hierarchical Regression for Maternal Social Problem Solving, Number of Children and the Interaction between Maternal Social Problem Solving and the Number of Children Predicting Child Social Problem Solving for the Perpetrator Sample*

Predictor	Child ASG ΔR^2	Child ASG β	Child Repetitions ΔR^2	Child Repetitions β	Child Irrelevant ΔR^2	Child Irrelevant β
Step 1						
Maternal Categories	.02	-.16	.10	.23	.07	.09
Maternal Elaborations		.14		.21		-.16
Maternal Irrelevant		-.04		.15		.23
Step 2						
Maternal Categories	.07†	-.07	.00	.25	.00	.11
Maternal Elaborations		.14		.21		-.16
Maternal Irrelevant		.04		.16		.25
Number of Children		.27†		.05		.07
Step 3						
Maternal Categories	.11	-1.02	.03	-.35	.02	.09
Maternal Elaborations		2.34*		.75		-.45
Maternal Irrelevant		-.84		.32		.67
Number of Children		.44*		.07		.03
Mom ASG*Num Child		-1.03		-.62		-.01
Mom Elab* Num Child		2.24*		.54		-.26
Mom Irr*Num Child		-.88		.18		.49
Total R^2	.20		.13		.10	
n	48		48		48	

** $p < .01$; * $p < .05$; $^\dagger p < .10$

81

Table 12. *Summary of Hierarchical Regression for Maternal Social Problem Solving, Number of Children and the Interaction between Maternal Social Problem Solving and the Number of Children Predicting Child Social Problem Solving for the Perpetrator Sample (Controlling for Maternal IQ)*

Predictor	Child ASG ΔR^2	Child ASG β	Child Repetitions ΔR^2	Child Repetitions β	Child Irrelevant ΔR^2	Child Irrelevant β
Step 1						
Maternal IQ	.00	.03	.10	.31	.04	-.19
Step 2						
Maternal IQ	.02	.05	.05	.28	.04	-.08
Maternal Categories		-.17		.18		.10
Maternal Elaborations		.13		.16		-.15
Maternal Irrelevant		-.02		.24		.20
Step 3						
Maternal IQ	$.07^{\dagger}$	.07	.00	.28	.00	-.07
Maternal Categories		-.08		.21		.12
Maternal Elaborations		.13		.16		-.15
Maternal Irrelevant		-.06		.26		.22
Number of Children		$.27^{\dagger}$		.07		.06
Step 4						
Maternal IQ	.12	.14	.03	.29	.05	-.12
Maternal Categories		-.83		.03		.06
Maternal Elaborations		2.43*		.94		-.53
Maternal Irrelevant		-.68		.64		.55
Number of Children		.46*		.12		.8
Mom ASG*Num Child		-.82		-.20		-.14
Mom Elab* Num Child		2.37*		.81		-.35
Mom Irr*Num Child		-.77		.41		.38
Total R^2	.21		.18		.10	
n	48		48		48	

** $p < .01$; * $p < .05$; $^{\dagger}p < .10$

Table 13. *Summary of Hierarchical Regression for Maternal Elaborations, Number of Children and the Interaction between Maternal Elaborations and the Number of Children Predicting Child Alternative Solution Generation for the Perpetrator Sample (With and Without Controlling for Maternal IQ)*

	Child ASG		Child ASG	
	Not Controlling IQ		*Controlling IQ*	
Predictor	ΔR^2	β	ΔR^2	β
Step 1				
Maternal IQ	--	--	.00	.86
Step 2				
Maternal IQ			.00	.00
Maternal Elaborations	.01	.07		.07
Step 3				
Maternal IQ	--	--	$.07^{\dagger}$	.01
Maternal Elaborations	$.07^{\dagger}$	.09		.08
Number of Children		$.27^{\dagger}$		$.27^{\dagger}$
Step 4				
Maternal IQ	--	--	.11*	.13
Maternal Elaborations	.09*	2.12*		2.31*
Number of Children		.43**		.46**
Mom Elab* Num Child		2.05*		2.30*
Total R^2	.17*		.18*	
n	48		48	

** $p < .01$; * $p < .05$; $^{\dagger}p < .10$

Table 14. *Independent Sample T-Test Examining Differences in Internal and External Supports in the Normative and Perpetrator Samples*

	Group Statistics				Independent Samples Test		
	Sample	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Depression	Normative	56	17.02	9.176	-4.332	100	.000
	Perpetrator	46	26.39	12.643			
Hrs/Week in Day Care	Normative	55	15.60	11.813	-3.810	96	.000
	Perpetrator	43	25.49	13.859			
Total Hrs/Week in the Care of Others	Normative	55	23.07	16.953	-3.304	98	.001
	Perpetrator	45	39.73	32.386			

** $p < .01$; * $p < .05$; †$p < .10$

Table 15. *Correlations between Internal and External Support Variables and Maternal and Child Social Problem Solving in the Normative Sample*

		Maternal Depression	Hours in Day Care	Hours in Out-of-Home Care
PPSI	Maternal Categories	-.02	.04	-.04
	Maternal Elaborations	-.09	-.06	-.17
	Maternal Irrelevant	.18	.08	-.10
PIPS Total	Child ASG	.05	-.17	-.10
	Child Repetitions	.05	-.19	-.09
	Child Irrelevant	.25†	.21	.18
PIPS Peer Stories	Child ASG	-.02	-.13	-.07
	Child Repetitions	-.10	-.19	-.09
	Child Irrelevant	.29*	.14	.13
PIPS Mother Stories	Child ASG	.01	-.10	-.07
	Child Repetitions	.11	-.13	-.05
	Child Irrelevant	.09	.22	.25†
Number of Children		.16	.02	-.10

** $p < .01$; * $p < .05$; $^\dagger p < .10$

Table 16. *Correlations between Internal and External Support Variables and Maternal and Child Social Problem Solving in the Perpetrator Sample*

		Maternal Depression	Hours in Day Care	Hours in Out-of-Home Care
PPSI	Maternal Categories	.14	.04	.23
	Maternal Elaborations	.41**	.17	.58**
	Maternal Irrelevant	-.06	-.09	-.22
PIPS Total	Child ASG	.22	.13	-.07
	Child Repetitions	.35*	-.03	-.05
	Child Irrelevant	-.06	.32*	.15
PIPS Peer Stories	Child ASG	.12	.10	.22
	Child Repetitions	.27†	-.06	-.04
	Child Irrelevant	.02	.33*	.11
PIPS Mother Stories	Child ASG	.23	.08	.39**
	Child Repetitions	.32*	-.03	-.28
	Child Irrelevant	-.22	.16	.16
Number of Children		.25†	-.25	-.07

** $p < .01$; * $p < .05$; $^\dagger p < .10$

Table 17. *Means and Standard Deviations for Maternal and Child Social Problem Solving*

Variable	Control Sample (N = 56) Mean (SD)	Maternal Perpetrator Sample (N = 19) Mean (SD)
Preschooler - PIPS Total		
Rate ASG[1]	.38 (.20)	.29 (.23)
Rate repeated solutions[2]	.74 (.53)	.54 (.58)
Rate irrelevant responses[3]	.28 (.26)	.33 (.23)
# stories attempted[4]	12 (3.08)	11.26 (3.09)
PIPS Peer Stories		
Rate ASG*[5]	.40 (.21)	.28 (.21)
Rate repeated solutions[6]	.74 (.56)	.67 (.85)
Rate irrelevant responses[7]	.32 (.30)	.38 (.31)
# stories attempted[8]	7.07 (1.68)	6.68 (1.64)
PIPS Mom Stories		
Rate ASG[9]	.34 (.24)	.34 (.29)
Rate repeated solutions*[10]	.76 (.70)	.41 (.49)
Rate irrelevant responses[11]	.21 (.30)	.27 (.20)
# stories attempted[12]	4.93 (1.75)	4.58 (1.71)
Mother - PPSI		
# categories of solutions†[13]	13.48 (3.11)	11.37 (4.14)
# solutions[14]	15.11 (3.65)	12.79 (4.91)
# elaborated solutions[15]	1.93 (1.74)	2.32 (2.03)
# irrelevant stories*[16]	.86 (1.14)	2 (1.92)

†*p* < .10, * *p* < .05, ** *p* < .01

[1] *t* (27.77) = 1.52, *ns*
[2] *t* (28.48) = 1.30, *ns*
[3] *t* (34.45) = -.96, *ns*
[4] *t* (31.05) = .90, *ns*
[5] *t* (31.24) = 2.06, *p* = .04
[6] *t* (23.59) = .32, *ns*
[7] *t* (30.44) = -.73, *ns*
[8] *t* (31.73) = .88, *ns*

[9] *t* (23.41) = -.01, *ns*
[10] *t* (38.57) = 2.30, *p* = .03
[11] *t* (41.49) = -.94, *ns*
[12] *t* (31.69) = .77, *ns*
[13] *t* (25.25) = 2.04, *p* = .05
[14] *t* (25.09) = 1.89, *ns*
[15] *t* (27.49) = -.75, *ns*
[16] *t* (22.44) = -2.55, *p* = .02

Table 18. *Two-Way ANOVA Examining Maternal and Child Social Problem Solving by Parenting Status and Sample*

	Normative vs. Perpetrator Sample	Single- vs. Dual-Parent Mothers	Parent Status*Sample
PPSI			
Maternal Categories	F (1, 100) = 1.05, p = .31	F (1, 100) = 6.50, p = .01*	F (1, 100) = .01, p = .93
Maternal Elaborations	F (1, 100) = 2.09, p = .15	F (1, 100) = 3.02, p = .09	F (1, 100) = .43, p = .51
Maternal Irrelevant	F (1, 100) = 3.05, p = .08[†]	F (1, 100) = 8.74, p = .004**	F (1, 100) = 1.26, p = .27
PIPS			
Child ASG	F (1, 100) = .04, p = .85	F (1, 100) = .33, p = .57	F (1, 100) = 1.76, p = .19
Child Repetitions	F (1, 100) = .06, p = .81	F (1, 100) = .25, p = .62	F (1, 100) = 8.55, p = .004**
Child Irrelevant	F (1, 100) = 2.24, p = .14	F (1, 100) = .37, p = .54	F (1, 100) = .18 p = .67

** p < .01; * p < .05; [†] p < .10

Appendix B: Measures

Background Information Sheet

Mother's name or # _____   Date _____

Date of Birth _____

Marital Status   M   Div   Sep   Single   Other

Education (last grade completed) _____

Employed?   Yes (1)   No (0)   Part-time No. of hours _____

Profession_____ (even if not currently working)

Father's birth date _____

Father's Education (last grade completed) _____

Father's occupation _____

Family Income

01.	Less than 8,000 a year	11.	26,011 to 28,000
02.	8,001 to 10,000	12.	28,001 to 30,000
03.	10,001 to 12,000	13.	30,001 to 35,000
04.	12,001 to 14,000	14.	35,001 to 40,000
05.	14,001 to 16,000	15.	40,001 to 45,000
06.	16,001 to 18,000	16.	45,001 to 50,000
07.	18,001 to 20,000	17.	50,001 to 55,000
08.	20,001 to 22,000	18.	55,001 to 60,000
09.	22,001 to 24,000	19.	Over 61,000
10.	24,001 to 26,000		

Number of siblings _____   Number of Pregnancies _____

Names, birthdates, ages, and sexes of children:

_____

_____

_____

Index child's age _____

Index child's sex   Male (1)   Female (2)

Birth order of index child: 1st   2nd   3rd   4th   5th

Mother's age when index child was born: _____

Mother's age when oldest child was born: _____

Was index child full term: Yes (1) No (0)

If no, weeks premature _____

Index child birth complications _____ Yes (1) No (0)

Nature of complication

Other Children Name	Full Term Yes (1)/No (0)	Weeks Premature	Birth Complications Be Specific

Index child in daycare/Head Start/nursery school?   Yes (1)   No (0)

Hours per week: _____

Other Caretakers:

_____   hrs/week_____
_____   hrs/week_____
_____   hrs/week_____
Total number of hours in the care of others   _____
Any counseling?   Yes (1)   No (0)

Other children in school information

Name	Daycare/School	Hours	Other Caretakers	Hours	Total

Race: Caucasian   Afro-American   Hispanic   Other_____
Urban   Rural
Have any of your children ever been in placement outside of the home, such as in Foster Care?
       Yes   No
       Who?   When?   For how long?

_____
_____
_____

The Parent Problem Solving Instrument
(PPSI; Wasik, Bryant & Fishbein, 1981)

INSTRUCTIONS:

In this part, we are interested in how people handle problems with children. You are to make up some stories (smile – Are you good at making up stories?) For each story you will be given the beginning of the story and how the story ends. Your job is to make up a story that connects the beginning that is given to you with the ending given you. In other words, you will make up the middle of the story. It's sort of like you were watching a movie and saw the first part, had to leave, and came back for the last part and someone asked you what happened in the middle.

Different people make up different stories. We would like you to make up a story that connects the beginning to the end. I will write down what you say (I want to get exactly what you say – so go easy on me). You can read along on the card while I read the story aloud. (Hand them the cards.)

1. Every time Paula sees a particular friend, who has 2 older children, her friend offers unwanted advice about how Paula should raise her baby. Paula is angry at her friend. The story ends with Paula no longer angry at her friend because she is no longer advising Paula without being asked. Begin the story with Paula being angry with her friend.

2. Mary has been feeling "cooped up" and lonely since her baby was born. There is a movie downtown that she should like to see. The story ends with Mary going to the movie with a friend and the baby being cared for by someone else. Begin the story with Mary wanting to go to the movie.

3. Gloria's baby has been fussy all day and seems to be running a fever. This is the first time her baby has seemed to be sick and she is very worried. The story ends with the baby asleep apparently feeling fine. Begin the story with Gloria thinking that her baby may be sick.

4. The baby's father doesn't think that Barbara is being firm enough with the baby. Barbara does not like the idea of punishing her baby but the father thinks the child is being spoiled. The story begins with Barbara and the father having an argument about whether to punish the baby. It ends with the agreement reached between the parents about the issue.

5. Pam is at the store with her baby when the baby gets cranky and starts to throw a temper tantrum. This makes Pam feel embarrassed and irritated. The story ends with the baby being quiet and content. Begin the story with Pam feeling embarrassed and irritated.

6. Sara's older boy, a 2-year old, was picking on the younger one. He took the baby's toys away, pushed him over, and made him cry. The story ends with both boys calmed down and playing nicely together. Start with Sara seeing the older one pick on the baby.

7. Martha is going back to work soon after her baby is born. Begin the story with Martha worried about what arrangement to make for her baby. End it with her finding a good place for him during the day.

8. Diane feels that her baby is ready to begin feeding himself. Up until now, she has fed the baby. The story ends with the baby feeding himself. Begin the story with Diane wondering what she can do to encourage her baby to be more independent in feeding.

9. Betty would like to see her toddler playing more with other children. The story ends with Betty's child playing more cooperatively with other children. Begin the story with Betty wondering what she can do to encourage her child to play more with other children.

10. Jean's baby has been crawling for some time and appears to be ready to begin walking. The story ends with the baby learning how to walk. Begin the story with Jean trying to think of ways to encourage her baby to walk.

The Preschool Interpersonal Problem Solving Test
(PIPS; Shure & Spivack, 1974)
PIPS Administration Booklet

PRESCHOOL INTERPERSONAL PROBLEM SOLVING (PIPS) Test

Simplified Form

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Child's Name _____

Sex   _____ M   _____ F

School   _____

Teacher   _____

Date   _____

Experimenter _____

<u>Instructions to Subject</u>:

    We want to know how children think about things. I've got
some pictures, and I'm going to tell you some stories about
children. I'm going to tell you the first part of the story, and
I want you to make up the rest of the story. I want you to tell me
what you think the child in the story could do. Pretend all the
children are (age of S).

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Peer Problem

1.   Here's A (*read name written on picture*) and here's B. A is
     playing with this truck/doll and he/she has been playing with
     it for a long time. Now B wants a chance to play with the
     truck/doll, but A keeps on playing with it.

     Who's been playing with the truck/doll for a long time? You
     can point. That's right, A. (*point to A*)

     Who wants to play with it? That's right, B.

     What can B do so he/she can have a chance to play with the
     truck/doll? (*If no new relevant response, "What can B
     say.....?"*)

          After 1st relevant solution is given: "That's ONE way.
          The idea of this game is to think of lots of different
          ways to get a chance to play with toys, O.K.?

2.   Now let's pretend that C has been playing with the shovel all
     morning, and D would like to have a chance to play with it.
     C keeps on playing with it.

     Who's been playing with the shovel all morning? Right, C.

     Who wants a chance to play with it? Right, D.

     What can D do so he/she can have a chance to play with the
     shovel? (*If necessary, "What can D say.....?"*)

3. Now let's say it's this way. E has been out in the yard for the whole play period, playing with this kite. F thinks he/she would like to play with the kite.

Who's been playing with the kite for the whole play period?

Who wants to play with the kite now?

What can F do so he/she can get a chance to fly the kite?

4. Today G has been on this swing, and H wants to ride on it.

Who is already on the swing? Right, G.

Who wants a turn on the swing? That's right, H.

What can H do so he/she can have a chance on the swing?

5. One day, I was playing with this drum, and he/she had been playing with it for a long time. J wanted to play with it.

Who had been playing with the drum? Right, I.

Who wants to play with it? Right, J.

What can J do so he/she can get to play with the drum?

6. K has been playing with this boat for a long time, and now L wants to play with it.

    Who's been playing with the boat for a long time?

    Who wants to play with it?

    What can L do so he/she can get to play with the boat?

7. M has had the spinning top all morning and N wants to have a chance with it.

    Who's been playing with this spinning top all morning?

    Who wants to play with it?

    What can N do so he/she can have a chance to play with the top?

If seven different solutions given, continue. Stop when no new solutions are given.

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8. Teddy Bear

9.   Piano

10. Telephone

11. Guitar

12. Punching Bag

(If child gives 12 different solutions, add new toys as needed)

Mother-Problem

1. Q broke his/her mother's favorite flower pot and he/she is afraid that his/her mother will be really mad at him/her.

    What can Q do or say so his/her mother will not be mad at him/her?

2. Now let's pretend that P scratched his/her mother's wood table, and it made a big scratch or mark on the table. His/her mother might be mad at him/her.

    What can P do or say so that his/her mother won't be mad at him/her?

3. Now let's say it's this way. Q burned a hole in his/her mother best dress and he/she was afraid his/her mother would mad at him/her.

    What can Q do or say so that his/her mother won't be mad at him/her?

4. One day <u>R</u> tore some pages in his/her mother's favorite book and he/she was afraid his/her mother would be mad.

    What can <u>R</u> do or say so his/her mother won't be mad?

5. <u>S</u> was playing ball and the ball hit a window. The window broke, and he/she knows his/her mother will be mad at him/her.

    What can <u>S</u> say or do so that his/her mother won't be mad?

If five different solutions given, continue. Stop when no new solution is given.
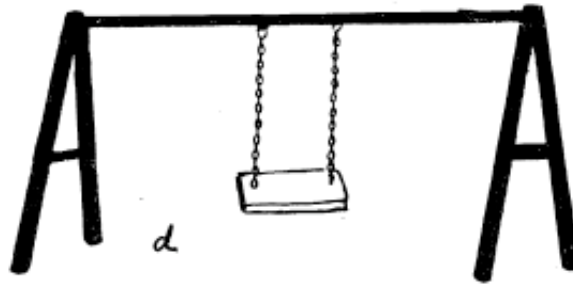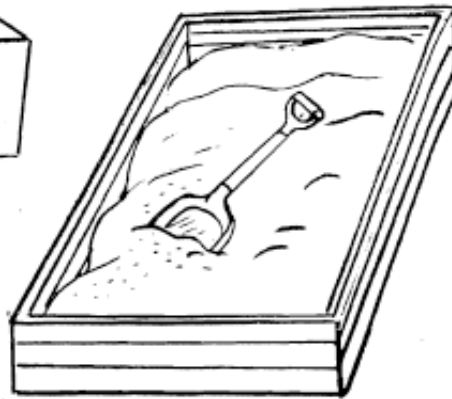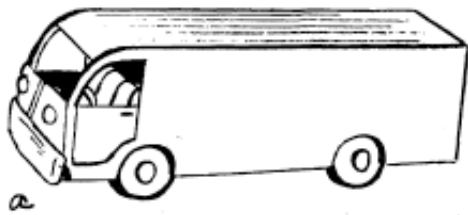
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6. Broken Dish

7.   Broken Glass

8.   Broken Ashtray

9.   Smashed Car Window

(Create additional acts of property damage as needed).

a

aa

b

c

d

e

f

The Center for Epidemiological Studies Depression Scale
(CES-D; Radloff, 1977)

INSTRUCTIONS FOR QUESTIONS: Below is a list of the ways you might
have felt or behaved. Please tell me how often you have felt this
way during the past week. HAND CARD A.
          Rarely or None of the Time (Less than 1 Day)
          Some or a Little of the Time (1-2 Days)
          Occasionally or a Moderate Amount of Time (3-4 Days)
          Most or All of the Time (5-7 Days)

During the past week:
1. I was bothered by things that usually don't bother me.
2. I did not feel like eating; my appetite was poor.
3. I felt that I could not shake off the blues even with help from my
    family or friends.
4. I felt that I was just as good as other people.
5. I had trouble keeping my mind on what I was doing.
6. I felt depressed.
7. I felt that everything I did was an effort.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.
12. I was happy.
13. I talked less than usual.
14. I felt lonely.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people dislike me.
20. I could not get "going."