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The effects of caregiver depression and caregiver stress on the relationship between poverty and social and emotional development in children

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**The effects of caregiver depression and caregiver stress on the
relationship between poverty and social and emotional
development in children**

by

William Roy Henninger IV

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Human Development and Family Studies (Early Childhood Special
Education)

Program of Study Committee:
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Iowa State University

Ames, Iowa

2010

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DEDICATION

Dedicated to:

My wife Elaine, who has kept me going through this process;

My pets, who remind me every day to be the type of person they think I am;

and,

My mother, father, sisters, nieces, and nephew.

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ABSTRACT

Literature on the course of children's social emotional development in early childhood is abundant. In addition, literature has identified that various family level variables play a role in a children's social emotional development. However, little research has utilized longitudinal panel data to investigate the relationship between children's social emotional development and caregiver's psychological well being.

In this paper, latent growth curves were constructed for children's externalizing behaviors, caregiver depression, and caregiver stress. Latent growth curves were constructed for caregiver stress, caregiver depression, and child externalizing behaviors. The mean score for participants were highest at the initial measurement points and decreased over the course of the subsequent measurement periods. A structural equation model was utilized to identify a model in which the effect of time living in poverty on externalizing behaviors was mediated by caregiver depression. In addition, the effect of caregiver depression on externalizing behaviors was mediated by caregiver stress. Implications and limitations of this study are discussed.

CHAPTER 1 INTRODUCTION

The importance of social emotional development to other developmental domains between birth and middle childhood is well documented (e.g., Center on Social Emotional Foundations in Early Learning, 2010; Harring, Barrat, & Hawkins, 2002; Sermud-Clikeman, 2007). The purpose of this literature review is to describe factors that influence children's social emotional development. Specifically, the literature review will describe the role caregiver-child interactions play in social emotional development from infancy to middle childhood. These interactions shape how children's social emotional development progresses through childhood, adolescence, and into adulthood (Cillessen & Belmore, 2004; Diener & Kim, 2003; Eisenberg et al., 1999).

This paper will describe the role interactions with caregivers and the child's environment play in the development of social emotional behaviors. Externalizing behaviors are behaviors or actions that are aggressive in nature and/or high in activity level and cause disruptions in the child's ability to form relationships with adults and peers (Sermud-Clikeman, 2007). Externalizing behaviors can greatly decrease the likelihood that children are able to appropriately and consistently interact with peers, caregivers, and teachers, and learn from these interactions. Finally, factors other than a child's behavior (e.g., poverty, parental stress, maternal depression) can play a major role in how a child develops socially and emotionally. Existing research on the role these family-level variables play on a child social emotional development are discussed.

A link between externalizing behaviors and internalizing behaviors has been well documented in the literature (e.g., Gilliom & Shaw, 2004; Kiesner, 2002). As a result, both externalizing and internalizing behaviors and their role in children's social emotional development have been described in the literature review. However, due to the scope of this project only externalizing behaviors are included into the analysis for this research project. In addition, a brief overview of the relationship between internalizing behaviors and social emotional development was included in the literature review as a result of the future research including internalizing behaviors and their relationship to externalizing behaviors, caregiver depression, caregiver stress, and additional variable.

Research Problem

The body of research on the effects of poverty on caregiver stress, caregiver depression, and social emotional development is large. However, the majority of research conducted in this area has utilized cross-sectional research and/or regression analysis to answer questions about the effect of poverty on caregiver depression and caregiver stress, and in turn the effect of caregiver depression and caregiver stress on social emotional development. Ideally, to investigate the relationship between these constructs, a longitudinal, panel dataset, with measurement points spanning from infancy to early childhood would be needed. In addition, the dataset would need participants who had a large amount of variability in how long they had lived in poverty so comparisons could be made between participants based on the length of time living in poverty.

The National Early Head Start Research and Evaluation Project collected longitudinal panel data on children living in poverty from birth through 5th grade. As a result of the longitudinal nature of the data, the statistical analyses that can be performed on this data set are more sophisticated than those previously conducted in the research literature. A latent growth curve analysis was used to identify the manner in which poverty affects the trajectory of caregiver depression and caregiver stress and, in turn, affects the trajectory of social emotional development. The findings from this study will give researchers and policy makers a more in-depth view into the mechanisms through which poverty affects social emotional development. In addition, the role caregiver stress and depression play in mediating the effect of poverty and the mediating relationship of caregiver depression on the relationship of caregiver stress and externalizing behaviors was investigated. These findings will greatly increase the knowledge of areas where services can be rendered for families to aid in intervention with externalizing behaviors.

Theoretical Framework

A bioecological systems model suggested by Bronfenbrenner (1977) was utilized to hypothesize the manner in which the constructs (e.g., maternal depression, poverty, caregiver stress, and social emotional development) presented in this paper relate to each other. A major tenet of Bronfenbrenner's theory (1995) is that development occurs through a series of interactions between human beings and entities in their environment (e.g., other individuals, objects, symbols). Learning and development occurs when these interactions happen consistently over time (Bronfenbrenner, 1995). Interactions between the person and other people, objects,

and individuals occur within structures (e.g., microsystems, mesosystems, exosystems, macrosystem, chronosystem) that become progressively more removed from the individual (Bronfenbrenner, 1994). Microsystems are considered the immediate environment in which the developing person lives (e.g., home, family, peer groups; Eamon, 2001). The mesosystem is the next system closest to the developing individual and is the interaction process between two microsystems that contain the developing person (Bronfenbrenner, 1994). The exosystem involves an interaction between two systems, but only one of the systems contains the developing child (Bronfenbrenner). Finally, the macrosystem involves the influences of culture as a whole, and chronosystem involves the influences of change and consistency over the life of the developing individual (Bronfenbrenner, 1995; Eamon, 2001). This paper conceptualizes the interactions within the child's microsystem (family) play a role in affecting the child's development. Specifically, the financial situation of the family influences the parents, which in turn influences the parents' interactions with the child and the child's development. The length of time that poverty influences the child's family microsystem is seen as an influence through the chronosystem and has an effect on development.

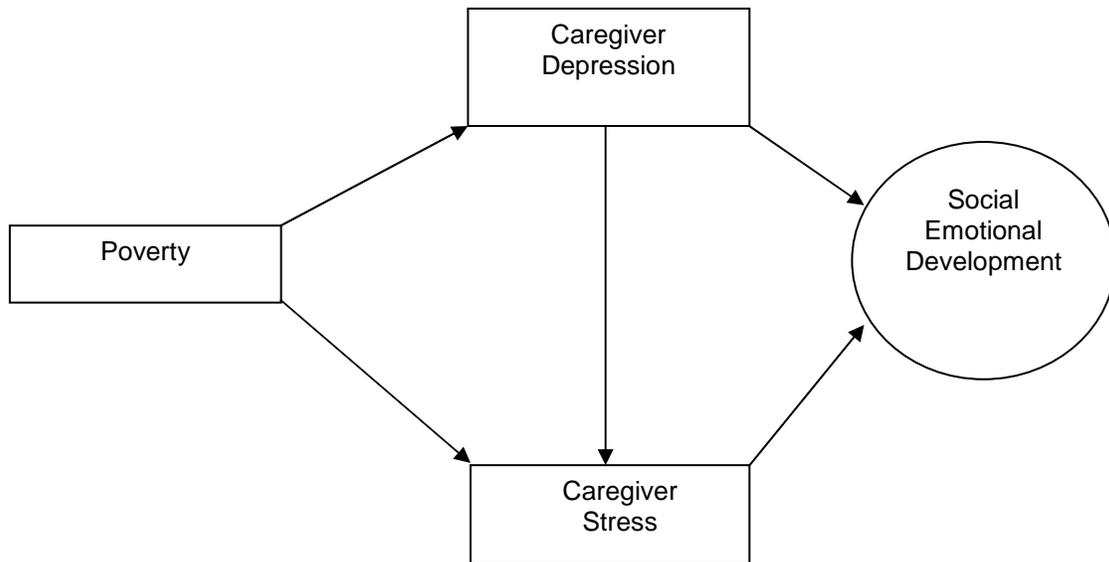


Figure 1. Conceptual Framework of Mediating Effect of Caregiver Stress and Depression on Poverty and Social Emotional Development

The mediating relationship hypothesized later in this study (see Figure 1) was derived from the idea that poverty stresses the family process and this affects the child's social emotional development (Conger et al., 1993). Specifically, stress can be seen as either acute or chronic (Perlin, 1989). For example, the loss of a substantial amount of income due to a specific financial disaster and the subsequent stress associated with the loss of income (e.g., finding new job, paying bills) would be considered acute stress. In contrast, a family that lives in prolonged poverty and must deal with the stress involved in consistent poverty (e.g., unable to consistently meet basic needs) experiences chronic stress. Previous research has suggested that this chronic stress leads to a decreased ability to cope in family processes and increases the likelihood that caregivers (specifically mothers) exhibit depressive symptoms (Brody et al., 1994).

The family process model was utilized to fully investigate the manner in which the concepts proposed in this study related to each other (Brody et al., 1994). When caregivers begin to experience depression, this can result in negative interactions between caregivers and their children (Brody et al., 1994). As a result, it is not so much the stress of poverty that creates poor social emotional outcomes for children, or caregiver depression alone, but the effect that these processes together have on the interaction between the caregiver and the child. The stress created by poverty is affecting the family microsystem and the family process. A mediating model is hypothesized where the effect of poverty on externalizing behaviors is mediated by the existence of caregiver depression, and this effect of caregiver depression is mediated by the presence of stress between the parent and child.

This study tested several models that looked at the relationship between poverty, caregiver depression, caregiver stress, and externalizing behaviors. A literature review is provided to set a context for the current study. The methodology of the current study and the ensuing results are provided, and finally the implications of the results of the current study are discussed.

CHAPTER 2 LITERATURE REVIEW

Social Emotional Development

Externalizing Behaviors

For the purpose of this study, social emotional development will be investigated by looking at the existence of externalizing behaviors as rated by parents. Sermud-Clikeman (2007) describes externalizing behaviors as behaviors or actions that are aggressive in nature and/or are high in activity level and can cause disruptions in the child's ability to form relationships with adults and peers. Children who exhibit externalizing behaviors are at risk for poor social emotional development (Kazdin, 1987). Specifically, young children who display externalizing behavior have difficulty engaging socially with their peers, both individually and in groups (Putallaz & Wessarman, 1990). Successfully engaging peers in play and social interactions is vital for healthy social emotional development (Brotman et al., 2003; Dodge, Coie, Pettit, & Price, 1990). Ladd and colleagues (1990) suggest that an ability to initiate and participate in social activities aids social emotional development and predicts how likely a child is to be accepted into future social groups.

Children exhibiting externalizing behaviors are likely to initiate social interaction and play through interactions that are viewed by their peers as aggressive or over-bearing (Brotman et al., 2005). In addition, children who exhibit externalizing behaviors are more likely to use inappropriate tactics such as crying or whining as a means to coerce their peers to play with them (Brotman et al., 2005). If these children do gain access to social groups, they often continue to have problems interacting with their peers. Webster-Stratton and Lindsey (1999) found that children

exhibiting externalizing behaviors have trouble matching their level of physical and emotional intensity to that of the other children in their play group. Also, these children overestimate their ability to interact in social situations (Webster-Stratton & Lindsey, 1999). An inability to match intensity levels with members of a group will often lead to peers ignoring the child or actively restricting their play in the group (Webster-Stratton & Lindsey, 1999). Finally, children low in social competence are likely to disrupt play (e.g., through interruption, changing play topic, removal of play objects) more often than children with average to above average social competence, and become increasingly likely to do so when play does not proceed the way they want (Putallaz & Wesserman, 1990). As a result, they are often seen as undesirable play partners by peers who may then avoid playing with them (Brotman et al., 2005; Webster-Stratton & Lindsey, 1999).

A large body of research suggests that externalizing behaviors tend to decrease through childhood (Bongers, Koo, van der Ende, & Verhulst, 2003; Lahey et al., 2000). The highest levels of externalizing behaviors typically present in early childhood and decrease into middle childhood and early adolescence (Bongers, Koot, van der Ende, & Verhulst, 2004). However, Bongers and colleagues (2003, 2004) found that some sub-samples of children demonstrate varying trajectories in their externalizing behaviors. Children whose externalizing behaviors do not decrease over the course of early and middle childhood are at an increased risk for poor school outcomes, run-ins with the law, and internalizing behaviors (e.g., Bongers et al.; Campbell, Shaw, & Gilliom, 2000; Duncan, Dowsett, Classen, Magnuson, Huston, Klebanov, et al., 2007). It is important that researchers continue

to extend Bongers and colleagues' research on what variables predict externalizing behavior, so interventionists can focus on variables that predict poor externalizing behavior outcomes.

Internalizing Behaviors

Internalizing behaviors are detrimental behaviors that affect children's internal psychological environment as opposed to their external environment. Specifically, these behaviors include anxiousness, depression, withdrawal, (Campbell et al., 2000; Eisenberg et al., 2001; Gresham et al., 1999). Evidence exists to suggest that internalizing and externalizing behaviors can coexist in children. Both Keisner (2002) and Morrow and colleagues (2006) found a co-occurrence of externalizing and internalizing behaviors across various ages of children (e.g., 2nd grade to 7th grade). In children who exhibit both externalizing (e.g., aggression) and internalizing behaviors (e.g., depressive symptoms), there is a marked risk for social rejection above and beyond what is expected for a child who demonstrates only externalizing behaviors (Morrow et al.; Patterson & Capaldi, 1990). As a result, children who are exhibiting both internalizing and externalizing behaviors are at extremely high risk for poor social emotional development.

Interestingly, some evidence suggests that existence of externalizing behaviors early in a child's development predicts a greater likelihood of internalizing behaviors in middle childhood and adolescence (Gilliom & Shaw, 2004; Kiesner, 2002; Keisner, Cadinu, Poulin, & Bucci, 2002). Gilliom and Shaw found that among their sample of boys 2 to 6 years in age, boys who had higher rates of externalizing behaviors were likely to exhibit higher rates of internalizing behaviors as they got

older. In addition, as externalizing behaviors began to decrease, internalizing behaviors increased in the children participating in the study (Gilliom & Shaw, 2004). As a result, it is important that when conducting research on externalizing behaviors, researchers are attuned to the relationship between internalizing and externalizing behaviors.

Infancy/Early Childhood

Social emotional development is a process that begins early in children's lives and has a vast influence over multiple areas of children's development (Harring, Barrat, & Hawkins, 2002). Social emotional development is described by the Center on the Social and Emotional Foundations of Learning (CSEFEL) as, "a sense of confidence and competence, an ability to develop good relationships with peers and adults, make friends, gets along with others, persist at tasks, follow directions, identify, understand, and communicate one's feelings/emotions constructively, manage strong emotions, and demonstrate empathy" (CSFEL, 2010). Research has demonstrated that social and emotional skills are vital in children's ability to be successful early in school settings (Raver, 2002).

Social emotional competence describes children's effectiveness at social interaction (Rose-Krasnor, 1997). Social emotional competence is vital for positive social emotional development because it allows children to interact with their peers and adults (Rose-Krasnor, 1997). It is through these interactions that children are able to further learn what is acceptable in social interaction, thus continuing to develop socially (Rose-Krasnor, 1997). Children first begin to develop social emotional competencies through interactions with their primary caregivers (Chazan-

Cohen, Jerald, & Stark, 2001; National Research Council and Institute of Medicine, 2000; Zeanah & Zeanah, 2001). These interactions can be as simple as responding to a child's cries for food or as complex as playing games that involve social turns (NRCIM). These interactions allow children to develop the skills and abilities necessary to regulate emotions, identify emotions in others, and effectively interact with peers and adults (Egeland & Bosquet, 2001; Volling, 2001).

Research has demonstrated children who exhibit externalizing behaviors early in their development are at an increased risk for exhibiting aggressive behaviors as they become adolescents and adults (e.g., hitting, kicking, fighting) (Hay, Castle, & Davies, 2000). However, externalizing behaviors tend to be most prevalent in early childhood and begin to subside as children age (Bongers, Koot, Vander Ende, & Verhulst, 2003; Tremblay, 2000). A predominant theory for this decrease is the development of verbal skills, which allows children to express their needs and desires verbally as opposed to physically (Bongers, Koot, Vander Ende, & Verhulst; Tremblay). In addition, children begin to develop emotional regulation skills in infancy, and their ability to regulate their emotions typically increases as they age (e.g., Cassidy et al., 2003; Cillessen & Bellmore, 2004). As a result of children's understanding of acceptable emotions for particular situations, a decrease in externalizing behaviors is often observed in typically developing children as they get older.

Pre-kindergarten

Social emotional development in pre-kindergarten aged children is marked by increased interactions with children of a similar age (Sermud-Clikeman, 2007).

These interactions are important because they are one way that children begin to utilize the social emotional skills that they learned from interacting with their primary caregivers (Denham et al., 2004). Denham and colleagues suggest that pre-kindergarten aged children are beginning to understand the emotions they are feeling and how they will be perceived by peers (e.g., emotional competence). As pre-kindergarten aged children mature, they begin to develop the ability to regulate their emotions to fit the situations in which they are engaged. As a result, pre-kindergarten children begin to show a marked decrease in the amount of volatile emotional outbursts (externalizing behaviors) exhibited in varied situations (Sermud-Clikeman, 2007).

Emotional regulation is broadly defined as a child's ability to match, change or adjust their emotional state (observable or unobservable) to what is acceptable in a specific situation (Cole, Michel, & Teti, 1994; Eisenberg & Spinrad, 2004; for an in-depth discussion of emotional regulation please see Eisenberg & Spinrad).

Emotional regulation is an integral part of social emotional development as it comprises children's ability to gauge how acceptable their emotions are for any given situation (Cillessen & Belmore, 2004) In pre-kindergarten children, emotional regulation and identification of emotions in peers plays a major role in the success in social interactions and play (Barth & Bastiani, 1997; Cassidy, Werner, Rourke, & Zubernis, 2003; Cillessen & Belmore, 2004). Barth and Bastiani suggest that children who accurately identify emotions in their peers have more positive relationships. One hypothesized reason for Barth and Bastiani's findings is that children with high emotional knowledge (i.e., ability to correctly identify emotions) are

sought out by other peers with high emotional knowledge (Cassidy et al., 2003; Denham, Von Salisch, Olthof, Kochanoff, & Caverly, 2004). As a result, children high in emotional knowledge interact with other children high in emotional knowledge, which results in positive relationships (Denham et al., 2004). In contrast, children who frequently identify their peers as being angry at them (correctly identifying or incorrectly identifying anger) generally have fewer positive relationships (Barth & Bastiani). One hypothesized reason for the fewer positive relationships observed for children who identify anger in peers is that they identify anger as a behavior (i.e., something that is done overtly, instead of an emotion) and act accordingly (Izard, Fine, Mostow, Trentacosta, & Campbell, 2002; Lemerise, Gregory, & Fredstrom, 2005). The ensuing action is often also aggressive in nature, resulting in poor outcomes for the specific interaction and for social relationships as a whole (Izard et al., 2002).

Some social emotional behaviors that are exhibited in pre-kindergarten aged children are predictive of deviant behaviors later in life (Diener & Kim, 2003). Specifically, pre-kindergarten children who display higher levels of internalizing and externalizing behaviors are at a greater risk for continuing to exhibit these behaviors as they get older (Eisenberg et al., 1999; Ladd & Price, 1987). Geunyoung and colleagues' (2007) administered peer and teacher report measures of children's behavioral and emotional development to investigate the link between peer interactions and later occurrence of externalizing behaviors. Geunyoung and colleagues findings suggested that children who are rated as "angry" by their peers and teachers early on are at an increased risk for exhibiting externalizing behaviors

once they reach 3rd through 6th grade. While Ponitz and colleagues' (2009) findings suggest that children who demonstrated better impulse control skills (e.g., less externalizing behaviors) were more likely to be rated positively in their ability to participate in activities that involved taking turns and listening to instructions (important skills for interacting with peers). Moreover, pre-kindergarten aged children who exhibit higher levels internalizing and externalizing behaviors are likely to be rejected by their peers when they attempt to initiate interactions (Hymel et al., 1993; Pardini, Barry, Barth, Lockman, & Wells, 2006). A major reason children exhibiting externalizing and internalizing behaviors are rejected when they attempt to initiate interaction with peers is because they are poor at judging the acceptability of their behaviors and interpreting the behaviors of the children with whom they are attempting to interact (Lemerise, Gregory, & Fredstrom, 2005; Ponitz et al., 2009). As a result, these pre-kindergarteners do not interact with other like their typically developing peers, and develop the social skills that are typically acquired through interactions with their peers.

There is some evidence to support that idea that gender plays a role in what is valued for social interaction in preschool. Cillessen and Bellmore (2004) found that boys tend to value physical play as a way to judge social standing, which leads to less positive peer relationships for boys (as a whole). While pre-kindergarten girls tend to value pro-social behaviors in their relationships and these relationships tend to be more positive than boys' relationships with peers (Cillessen & Bellmore, 2004). Boys and girls who exhibit internalizing behaviors are more likely to experience

rejection from their peers (Cillessen & Bellmore; Diener & Kim, 2003; Sermud-Clikeman, 2007).

Middle Childhood

Social emotional development in middle childhood (7 to 12 years old) is marked by a greater increase in peer social interaction than in any previous stage in development (McHale et al., 2003; Sermud-Clikeman, 2007). Unlike at early ages, children in middle childhood begin to cultivate friendships that endure longer and involve more in-depth social and emotional interaction (Samter, 2003). These relationships also become the mode through which children refine acceptable social and emotional interaction skills they have previously learned through interactions with parents and peers (Cillessen & Bellmore, 2004). Through interactions with peers, children begin to learn new skills that will aid them in developing effective social interactions later in life (Cillessen & Bellmore, 2004).

A child's capacity to interact effectively in a group is vital to social emotional development in middle childhood (Cillessen & Bellmore, 2004; Rose & Asher, 1999). It is important that children are able to enter into peer groups in a way that allows them to assimilate into the activity and conversations that are taking place in the group (Green & Rechis, 2006). Children who were able to match and/or assimilate their speech and behavior with group activities were allowed to integrate into the group (Green & Rechis, 2006; Putallaz & Wasserman, 1990). However, children who exhibited interruption, were self focused, or showed belligerence were less likely to be allowed entry into the peer group (Green & Rechis; Putallaz & Wasserman). This finding suggests that group entry is contingent not only on effective communication,

but also on emotional regulation and impulse control skills that are being honed during middle childhood.

Upon entering social groups, children are expected to interact with group members and follow the course of group activities to continue to be included (Samter, 2003). Zsolnai (2002) demonstrated that positive listening skills (e.g., non-verbal attentiveness, speaker attentiveness) are associated with greater social acceptance. Rydell and colleagues (2003) suggest that children who are able to control their emotional over-exuberance (i.e., excessive excitement) are likely to be successful in group interactions. These results imply that the existence of significant externalizing and internalizing behaviors in middle childhood can be detrimental to appropriate social interaction.

Differences in how males and females interact in social groups exist during middle childhood. Boys' social interactions tend to be based in groups, whereas girls are likely to interact in pairs (Samter, 2003). Boys' interactions are based around competitive acts (e.g., sports, games, story topping), and girls' interactions are prosocial in nature (e.g., listening, sharing feelings) (Raffeli & Duckett, 1989; Thorne, 1986). Interestingly, in middle childhood both boys and girls low in social competence are likely to exhibit aggressive behaviors when interacting with peers and underestimate their aggressiveness in these social situations (Foster, 2005; Grotzinger & Crick, 1996). These underestimations of aggressiveness could lead overly aggressive children to continue their aggressive tendencies, even when social cues from peers suggest that they change their behavior. However, boys'

aggression tends to be physical, while girls' tends to be social (Grotmeter & Crick, 1996).

The competitive nature that boys' interactions take on may explain why their aggression tends to be physical in nature. Specifically, a majority of the competition in which boys take part is based around sports and physical activity, creating a precedent for physical interaction (Grotmeter & Crick, 1996; Raffeli & Duckett, 1989); as opposed to girls, where prosocial interactions in middle childhood are the norm and would set precedence for social aggression (Grotmeter & Crick, 1996; Raffeli & Duckett, 1989). As a result, boys and girls are both participating in aggression, but it is taking on different forms because of the typical interactions in which each gender participates.

Parker and Seal (1996) found that children with below average social development (e.g., inability to regulate emotional exuberance, overly aggressive) were excluded from social groups by peers. Acceptance into social groups is important in childhood because it has been linked to academic success, as well as healthy self-esteem (Hart et al., 2003). Cillessen and Bellmore (2004) postulated that children whose social emotional development is below average have negative outcomes because they are missing a vital portion of their learning that is garnered through interaction with their peers. In addition, these children are not able to improve their social skills because they are excluded from the social group interaction that would teach them correct group interaction skills (Cillessen & Bellmore, 2004).

Social Emotional Development and Poverty

Poverty and socioeconomic status affect many facets of families and children's developmental trajectories. The relationship between social and emotional development and socioeconomic status (SES) is well documented in the literature (Brooks-Gunn & Duncan 1997; Duncan, Brooks-Gunn & Klebanov, 1994; McCoy et al., 1999; McLeod & Shanahan, 1993; Moore, Gleib, Driscoll, Zaslow, & Redd, 2002). Children who live in low-income environments are more likely to experience exhibit externalizing behaviors (reported by mother, measured by Child Behavior Profile; Achenbach & Edelbrock, 1984) than those living in environments that are deemed to have moderate income levels or to be affluent (Duncan, Brooks-Gunn, & Klebanov, 1994). Likewise, Knapp and colleagues (2007) have found that early behavioral problems, in conjunction with low-income status, can increase the negative effect of behaviors problems on children's social emotional development.

Researchers have shown that externalizing behaviors are more prevalent in low SES samples than in typical or high status samples (e.g., Duncan & Brooks-Gunn, 1997; Miech, Caspi, Moffitt, Wright, & Silva, 1999). Miech and colleagues found that families with low educational attainment and family income early on in their child's life were more likely to have children who exhibited antisocial behavior in their middle childhood and adolescent years. Earls' early research (1980) suggested that no effect of social class on social emotional development (measured utilizing an author constructed questionnaire that based on symptom loading) existed in a sample of 110, 3 year-old children. However, Briggs-Gowan and colleagues (2001) found that economic disadvantage did play a role in the existence of behavioral

problems (measured by the Child Behavior Checklist; Achenbach, 1991) in their sample of 1 to 2 year olds.

Evidence supporting the negative effect of poverty on social emotional development as children reach pre-kindergarten and middle childhood is much stronger than evidence of the effect of poverty on very young children (birth to 1 year old) (McLeod & Shanahan, 1993; Mistry et al., 2002). McLeod and Shanahan's findings suggested that children between the ages of 4 to 8 were more likely to show poor social emotional development (e.g., the existence of both internalizing and externalizing behaviors) the longer they had lived in poverty. Evidence suggests that the effect of low SES becomes more pronounced in children's behaviors and interactions the older they become (Bradley & Corwin, 2002). Mistry and colleagues also found that children were more likely to exhibit poor social emotional development the longer their families were in poverty. In addition, Mistry and colleagues found that single parents who felt high levels of economic stress were also more likely to have children who exhibited both externalizing and internalizing behaviors. Taekuchi and colleagues (1991) also found the stress caused by inadequate financial support experienced by parents can negatively affect a child's social emotional development.

In early childhood, the stress of raising a child, in conjunction with financial stress, can create an environment where caregivers are overwhelmed in taking care of their children (Avison, 1997). Muslow and colleagues' (2002) research demonstrates that caregivers under high levels of stress are more likely to report that it is hard to care for their children. These beliefs may lead parents to have less

positive interactions with their children and create an environment where externalizing behaviors are more readily present (Muslow et al., 2002). There is also some evidence to suggest that interventions that decrease the stress caregivers feel from insufficient finances are related to a decrease in poor social emotional development (Kadzin & Whitley, 2003). The success of Kadzin and Whitley's intervention suggests that the mediating link of stress on the relationship between poverty and externalizing behaviors may be a good place to look when creating interventions.

Brooks-Gunn and Duncan (1997) suggest that children who live in poverty for an extended amount of time are likely to exhibit developmental deficiencies in multiple areas (e.g., academic, achievement, social and emotional development). Specifically, poverty that is experienced during a child's early years (beginning around 2) has a greater negative effect on the child's social emotional development than poverty experienced later in life (Duncan et al., 2007). Duncan and colleagues (2007) found that children who lived in low-income families were more likely to exhibit externalizing behaviors than their peers living in middle to upper income families. These findings were independent of family structure and mother's level of education.

McLeod and Shanahan (1993) suggest that children who live in poverty over a long period of time are more likely to demonstrate internalizing behaviors than their peers who have lived in poverty a short time or have not experience poverty at all. In addition, both Brooks-Gunn and Duncan (1997) and McLeod and Shanahan found that children who have lived in poverty a short time were more likely to exhibit

externalizing behaviors than children not living in poverty or children living in poverty for an extended period of time. However, Mistry and colleagues (2002) have suggested that the longer a child spends in poverty the greater the likelihood they will exhibit externalizing behaviors. These findings are at odds and warrant additional research that can demonstrate the relationship between poverty and externalizing behaviors over time.

The effect of prolonged poverty on children's externalizing behaviors is hypothesized to be mediated by factors in the family environment (e.g., maternal depression, perceived parental support; Tracy et al., 2008). Eamon and Zuehl (2001) identified a mediating presence of maternal depression on the relationship between poverty and social emotional development. Specifically, Eamon and Zuehl's sample of 878 children ages 4-9 returned results where maternal depression was fully mediating the effects of poverty on externalizing behaviors. These results suggest that early poverty affects parents' mental health and well being, which in turn affects children's health and well being.

Poverty and Maternal Depression

A large body of research exists to suggest that there is a relationship between poverty and maternal depression, where increased time in poverty corresponds to a greater occurrence of depressive symptoms (e.g., Chazan-Cohen, Ayoub, Pan, Roggman, Raikes, Mckelvey, et al., 2007; Petterson & Friel, 2001). It has been estimated that 40%-59% of mothers from low-income/impoverished conditions exhibit depressive symptoms that could be considered severe or clinical (Loeb, Fuller, Kagan, & Carroll, 2004; Malik, Boris, Heller, Harden, Squires, Chazan-Cohen

et al., 2007). This relationship between maternal depression and poverty/SES (i.e., time spent in poverty, years of education completed) has been observed in the Early Head Start Research and Evaluation Project (EHSRE) participants used for this study (Chazan-Cohen et al., 2007; Malik et al., 2007). Specifically, Malik and colleagues utilized the EHSRE dataset to construct and test a model with variables (e.g., child aggression, relationship satisfaction) that assessed the contributions of contextual factors to maternal depression. In this study, they found that SES (defined by years of education, reported amount of monthly income, and employment status) uniquely contributed to the amount of depressive symptoms mothers reported (Malik et al., 2007).

Stress caused by impoverished conditions has been one of the major reasons cited for the high rates of maternal depression among impoverished populations (Gutman, McLoyd, & Tokoyawa, 2005). Gutman and colleagues, hypothesized that the stress associated with finding the means to provide for a family (i.e., food, clothing) creates a large portion of the stress associated with developing depressive symptoms in this population. In Casey and colleagues' (2004) research looking at the predictors of maternal depression of mothers with children around 36 months old, depression was predicted by food scarcity and lack of financial support. Women living in poor conditions experience a higher rate of these chronic life stresses than women in the general population (Ennis, Hobfoll, & Schroder, 2000).

Interventions that address maternal depression early in the course of the mother's depression, and address the children's development are important because these interventions have been shown to decrease depression and negate the poor

outcomes in children associated with maternal depression (Sohr-Preston & Scaremella, 2006). However, mothers living in impoverished conditions are less likely to seek out help for their depression and less likely to seek out health care for their children than mother not living in poverty (Minkovitz, Strobino, Scharfstein, Hou, Miller, & Mistry, et al., 2005). These findings suggest there may be a benefit to addressing caregiver mental health when improvements in a child social emotional development are sought.

Social Emotional Development and Maternal Depression

Maternal depression has been associated with multiple and various effects on the development of children (Cummings & Davies, 1994; Lesesne, Visser, & White, 2003). These negative outcomes span all facets of development: academic, cognitive, behavioral, and social emotional (e.g., Hay et al., 2001; Kuczynski, & Kochanska, 1990; Murray, Hipwell Hooper, Stein, & Cooper 1996; Murray et al., 1999). It appears that maternal depression may negatively influence social and emotional development as early as during pregnancy, where maternal depression during pregnancy predicts later negative social emotional development of children (Luoma et al., 2001; Owens & Shaw, 2003). The negative effect of maternal depression on externalizing behaviors continues through the child's adolescent years (Luoma et al; Owens & Shaw). Field (1997) found that children whose mothers experienced depression while the child was in-utero were more likely to exhibit negative social and emotional outcomes in their infancy. It has been hypothesized that infants and toddlers of mothers who are depressed do not participate in as many social interactions with their mothers as children of non-depressed mothers

(Field, 1992). A child's interactions with mother are important because they lay the ground work for successful future interactions with peers and adults (Field, 1992). Field hypothesized that depressed mothers are unable to respond to their child's cues for comfort, food, and communication prompts as a result of their depression. Radke-Yarrow and colleagues (1992) also found that depressed mothers were unable to respond to their child's social cues, and thus fail to give children feedback on appropriate social interactions.

Children who have depressed mothers have been shown to be at a greater risk for impaired social emotional development as they become school aged compared to children whose mothers were not depressed (Leve, Kim, & Pear, 2005). Specifically, children of depressed mothers showed a decreased ability to cultivate positive peer relationships and greater externalizing behaviors as well as greater internalizing behaviors (Downey & Coyne 1990; Gelfand & Teti, 1990; Webster-Stratton, 1990). Leve and colleagues' research identified that children who experienced maternal depression over the course of their childhood were more likely to exhibit externalizing behaviors later into early adolescence when compared to peers who did not experience persistent maternal depression. Likewise, Shaw and colleagues (2005) constructed growth curves and then identified latent class trajectories which divided participants into developmental groups based on predictor variables. Shaw and colleagues identified a class in which a greater existence of externalizing behaviors when children's (measured at 2 years through 8 years) mothers exhibited high levels of depressive symptoms. Moreover, Goodman and Gotlib (1999) postulate that the later in life a child is first exposed to maternal

depression the less likely the child is to exhibit the negative social and emotional outcomes listed above.

Maternal Depression, Parental Stress & Externalizing Behaviors

The effects of maternal depression appear to influence the manner in which mothers interact with their children (Waylen & Stewart-Brown, 2010). Waylen and colleagues study of children aged 8 months through 33 months and their mothers identified that mothers who had an increase in depressive symptoms throughout the study were also likely to have fewer positive interactions with their children. In addition, if poverty increased for these families, mothers were also more likely to exhibit depressive symptoms. Cummings and colleagues (2005) reported that in their sample of 235 families with children in kindergarten, maternal depression decreases were associated with decreases in children's social and emotional development problems (measured by the Child Behavior Checklist; Achenbach, 1991). This finding suggests a link between maternal depression and children's social emotional development exists.

Some research exists to suggest that parental stress can play a role in affecting social emotional development in children (Costa, Weems, Pellerin, & Dalton, 2006; Grant et al., 2003). Costa and colleagues found that parental stress (measured utilizing the Parental Stress Index; Abidin, 1995) predicted the existence of externalizing behaviors and internalizing behaviors in their sample of 300 families. However, Costa and colleagues did not find a link between maternal depression and parental stress or a mediating effect of parental stress on maternal depression and externalizing behavior. Previous researchers have found a significant relationship

between caregiver depression and caregiver stress (measured by the Parental Acceptance-Rejection Questionnaire; Rohner, Saavedra, & Granum, 1991), but a mediating path from maternal depression to parental stress to social emotional development was not identified in their findings. As a result, the literature is consistent in demonstrating that there is a direct association between maternal depression and social emotional development, but is contradictory regarding the mediating effect of parental stress between maternal depression and social emotional development. More work is needed to better understand the relationships of these variables and their effect on children's social emotional development.

Children who come from homes with insufficient economic resources and have mothers who are depressed, are likely to exhibit social emotional developmental deficits above and beyond what is expected from a child living in solely in poverty or a child with a depressed mother (Goodman & Gotlib, 1999). Carlson and Corcoran (2001) found that in their sample of 7-10 year-olds from the National Longitudinal Survey of Youth (NLSY) that the effect of poverty on negative social behaviors (e.g., fighting with peers, belligerence) was mediated by maternal mental health. Specifically, the longer mothers spent in poverty, the more likely they were to experience depression; in turn, higher depressive rates experienced by mothers predicted greater occurrences of externalizing behaviors among children (Carlson & Corcoran. 2001). Finally, the effects of maternal depression are influenced by the resources (both emotional and financial) a family has at its disposal to cope with maternal depression (Carlson & Cocroran, 2001). Malik and colleagues (2007) utilized a sub-population of the Early Head Start Research and

Evaluation Project to investigate the relations between poverty, maternal depression, and social emotional development in children 44 months to 12 years old. In their sample, poverty was linked to maternal depression and maternal depression was linked to poor social and emotional outcomes. However, they did not investigate a mediating link where maternal depression mediated the link between poverty and social emotional development (Malik et al., 2007). One possible reason for Goodman and Gotlib's findings is that both maternal depression and limited economic resources negatively influence interactions between the mother and child, which impedes the child's ability to gain the social interaction he or she needs for social emotional development. It is evident from these findings that maternal depression plays a detrimental role in how children develop socially and emotionally.

Summary

As documented, social emotional development is a process that begins early and affects the success children experience in multiple realms of development (e.g., academic, social, cognitive). Specifically, children who are able to interact positively with caregivers, teachers, and peers are more likely to be successful in their social relationships, cognitive development, and academic endeavors because they are able to learn through social interactions. However, children who are unable to enter peer groups or interact appropriately with adults and peers are at an increased risk for not obtaining the social interactions needed to learn how to engage productively with others and not being able to learn from these interactions. The risk of poor social emotional development is compounded by the effect of family level variables (maternal depression, family income, caregiver stress), which can play a major role

in the course of a child's social emotional development. Researchers suggest that these constructs (e.g., externalizing, internalizing, low SES, maternal depression) affect social emotional development negatively, but we do not know when children begin to manifest the negative effects of these constructs. In addition, we are not sure how these constructs relate to each other over the course of time, a family's development, and a child's development. It is important that we have an understanding of how these family-level variables contribute to social emotional development, so that effective interventions can be created that address all areas that influence social emotional development. As a result, the hypothesized model was constructed to demonstrate that manner in which the researcher felt poverty, caregiver stress, and caregiver depression relate to social emotional development.

In accordance with model presented in Figure 1, the following research questions were created to investigate the efficacy of the model.

Research Questions:

1. What effect does the length of time living in poverty play in children's social and emotional development from early childhood to 5th grade?
2. What role does the existence of caregiver depressive symptoms play in mediating the effects of poverty on children's social and emotional development from early childhood to 5th grade?
3. What role does the existence of caregiver stress play in mediating the effects of poverty on children's social and emotional development from early childhood to 5th grade?

4. What role does the existence of caregiver stress play in mediating the effect of maternal depression on children's social emotional development from early childhood to 5th grade?

CHAPTER 3 METHOD

National Early Head Start Research and Evaluation Project

This study used data collected as part of the Early Head Start Research and Evaluation Project (EHSRE). This project is a cross-site national study, with a main objective to investigate and assess the impacts of Early Head Start (EHS) on family and child outcomes. The study was conducted by Mathematica Policy Research, Inc., and Columbia University's Center for Children and Families and Teachers College, in collaboration with the Early Head Start Research Consortium. Funding came from the Administration on Children, Youth, and Families (ACYF). The research goals of the overall study were to “(1) understand the extent to which the Early Head Start intervention can be effective for infants and toddlers and their low-income families, and (2) understand what kinds of programs and services can be effective for children and families with different characteristics living in varying circumstances and served by varying approaches” (Administration for Children, Youth, and Families, 2002, pp. 16-17).

The data come from 17 sites around the country where Early Head Start programs started in 1995. Participants in the Early Head Start Research and Evaluation Project, recruited between July 1996 and September 1998, were families who applied for Early Head Start services and then were screened to determine if they qualified for the program. Each Early Head Start site was allowed to determine their own criteria with income (using the federal poverty guidelines) as the primary factor in determining eligibility. A family's unique needs were also taken into account, as Head Start guidelines allow children who do not meet low-income criteria to

participate if they may be benefited by the program. Some sites used a weighting or point system to determine eligibility. A total of 3,001 families were originally recruited for the study (Administration for Children, Youth, and Families, 2002).

Research sites recruited twice as many families as would be included in the program. Some programs placed special emphasis on recruiting specific groups (e.g., teen mothers). Families that were deemed "eligible" for EHS and then selected were randomly assigned to either the program or control group. Control group families could not receive Early Head Start services until their child was 3 years of age, when the child would be old enough for a Head Start program, but could access other community services for which they were eligible. There were 1,513 families assigned to the program group and 1,488 to the control group. Demographic characteristics of the two groups, such as income, age and education of the mother, and ethnicity, did not differ (Administration for Children, Youth, and Families, 2002).

The national evaluation project was designed to examine outcome variables of the Early Head Start program. The three major outcome variables were service use, child development and parenting; and family development. Child assessments were conducted at approximately 14, 24, 36 months after birth. Because families were recruited over a three year period, assessments related to the age of the child also occurred over a three year period. Grade related assessments were conducted at pre-kindergarten (the spring/summer before the child was age eligible to enter kindergarten) and 5th grade. Overall response rates were similar between the program and control group. Families received a small stipend for their participation in

each part of the study, such as a \$10-\$50 gift certificate to a local store (Administration for Children, Youth, and Families, 2002).

An application for Institutional Review Board (IRB) approval of this dissertation was submitted to the Iowa State University-IRB in May of 2010. The Iowa State University-IRB responded with a letter stating that the current research project, “does not involve human subjects according to federal regulations.” As a result, this project was determined to be exempt from requiring further review by the Iowa State University IRB.

Participants

Children whose primary caregiver had filled out information for the Child Behavior Check List (CBCL) for the 24-month, 36-month, prekindergarten, and 5th grade data points were included in the analysis. Participants included in the study (completed the full CBCL at all measurement points, $n = 1067$) did not differ from the participants who were not included in the study (i.e., did not have CBCL data for all 4 measurement points; $n = 1934$) by gender, ethnicity, household income at baseline or child’s grade 5, highest grade completed by mother at baseline or child’s 5th grade, or mother’s employment status at baseline or child’s 5th grade. Participants included and not included in this study were compared on baseline and 5th grade measures because these were the most complete set of measures of any of the data points present for each group. In addition, it was assumed that difference between participants included and not included in the study would be most prevalent before entering the study or at completion of the study.

Children. Of the children selected for analysis in this study 52.9% were male and 46.8% were female; one of the participants that was selected did not have data entered for their gender (see Table 1 for details). Participating children were from the following ethnic groups: 37.8% white or Caucasian, 32.1% African American, 23.9% Hispanic, and 4.3% “other”.

Table 1

Demographic Variables of Families Participating in Study

Variable	Baseline Total(%)	5 th grade Total(%)
Child	1,067	1,067
Gender		
Male	564 (52.9)	
Female	503 (47.1)	
Ethnicity		
White	404 (37.8)	
African Am.	343 (32.1)	
Hispanic	256 (23.9)	
Other	46 (4.3)	
Missing	18 (1.9)	
Caregiver		
Age of Caregiver		
Mean age	23.8	34.5
Range of ages	14 to 46 years	23 to 58 years
Education of Mother		
< High School	446 (41.7)	211 (20.7)
Diploma/GED	302 (28.3)	242 (22.6)
Some post-secondary	238 (22.3)	278 (26.0)
Bachelors, AA, or higher	63 (5.9)	170 (15.9)

Table 1 continued

Variable	Baseline Total(%)	5 th grade Total(%)
Missing	18 (1.8)	168 (15.7)
Work Status		
Full Time	297 (27.8)	475 (44.4)
Part-time	164 (15.4)	167 (15.6)
Unemployed	590 (55.3)	322 (30.1)
Missing	16 (1.5)	105 (9.8)

Caregivers. Of the 1067 caregivers of children included in this study, 99.3% described their relationships to the child as “mother” at baseline. At 5th grade 93% of the caregivers were the children’s mother; 4.8% of caregivers described themselves as “grandparents.” The mean age of caregivers at baseline of the study (random assignment) was 23 years and 8 months. The mean age of caregivers at the 5th grade measurement point was 34 years and 5 months.

At baseline, the largest number of caregivers (41.7%) had less than a high school diploma. The caregivers included in this sample increased their education level at the fifth grade measurement point, where the largest portion of caregiver (26%) reported some post-secondary education, no degree. At baseline the largest portion of caregivers in the sample (55.3%) reported they did not have a job or were unemployed. At the 5th grade measurement point the largest portion of caregivers (44.4%) reported they were employed full time.

Measures

Demographics. At the time of application and at each measurement point, demographic data were collected for each family. These data included primary caregiver age, education, income, and ethnicity.

Social emotional development. The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000; Achenbach, 1991) is a measure utilizing parent report to gauge social emotional development in children. Multiple forms of the CBCL exist for various age groups (e.g., CBCL 4 years – 18 years; CBCL 1.5 years to 5 years). For this study the CBCL 1.5 years to 5 years was used for the 2 year, 3 year, and Pre-k measurement points, while the CBCL 4 years – 18 years was used for the 5th grade measurement. The Child Behavior Checklist can be self-administered or administered through an interview. The CBCL can be used to assess changes in child behavior over time. Items on the CBCL use a 3-point Likert scale, with item ratings ranging from "1 - Not true" to "3 - Often true". These items can be summed into scales that measure internalizing behavior, externalizing behavior, and total problem sub-scales. In addition, items can be divided into several smaller scales including aggressive behaviors, anxious/depressed, attention problems, delinquent rule-breaking behaviors, social problems, somatic complaints, thought problems, and withdrawn behaviors. The externalizing scale of the CBCL was utilized in this study for two reasons. First, this is an area that can indicate significant behavioral concerns for children; children exhibit their highest levels of externalizing behaviors early in their development (ages 1-3; Bongers, Koot, Vander Ende, & Verhulst, 2003) and the ages of the participant coincide with this spike and subsequent

decrease. Second, full externalizing scales were present for the 2 year, 3 year, prekindergarten, and 5th grade measurement points, which allowed the researchers to construct latent growth curves for this scale.

At the 5th grade measurement point the full CBCL/4-18 (Achenbach, 1991) was used. This version of the CBCL measures social emotional development from ages 4-18. The CBCL/4-18 was normed on a nationally representative sample of 2,368 children. Test-retest reliability was reported between $r = .95$ to $r = 1$ (Achenbach, 1991). Cronbach's (1951) alpha for internal consistency has been reported between $r = .72$ to $r = .96$. Support for the construct validity was also supported in the CBCL by correlating its corresponding scales with already established measures (Achenbach, 1991). Correlations between the scales of each measure ranged from $r = .59$ to $r = .89$ (Achenbach, 1991).

The Child Behavior Checklist/1.5-5 (CBCL/1.5-5; Achenbach & Rescorla, 2000) is a parent report measure that assesses behavioral problems and social competencies in young children (ages 1.5 years old to 5 years old). The CBCL/1.5-5 can be completed by parents or administered through interview. The CBCL/1.5-5 is comprised of 99 items with a scale that ranges from "1 - Not true" to "3 - Often true." The full CBCL/1.5-5 can be divided into several scales including, "internalizing," "externalizing," and "total problem" scales. For the purpose of this study we will be utilizing the externalizing behaviors scale.

The CBCL/1.5-5 was normed on a nationally representative sample of 700 non-referred children (Achenbach & Rescorla, 2000). The 8 day test-retest reliability for the CBCL1.5-5 ranged from $r = .87$ to $r = .90$ for the internalizing, externalizing,

and total problem scales. Referred children scored significantly higher than non-referred children on the total problem scale (Achenbach & Rescorla, 2000); suggesting there is evidence that the CBCL/1.5-5 is a valid measure for distinguishing children displaying social and emotional development issues from those who are not exhibiting social emotional development issues.

Abbreviated versions of the CBCL/1.5-5 were administered to children at the 24 month, 36 month, and pre-kindergarten measurement periods. These measures were 32, 39, and 50 questions in length, respectively. The abbreviated versions included the externalizing scales and the aggressive behavior scales of the CBCL. Questions were selected to be included in this section of the Early Head Start parent interview by utilizing an expert panel comprised of members of the Head Start Family and Child Experiences Survey (FACES) research team and Head Start Quality Research Consortium. At the 5th grade measurement period, the full CBCL/4-18 version was administered. The externalizing behavior scale is typically comprised of 24 items (Achenbach & Rescorla, 2000). However, a scale consisting of 22 questions was utilized at each of the 4 measurement points in this study. The items "hurts animals or people without meaning" and "wanders away" were omitted from the interview because the expert panel felt they did not accurately depict externalizing behaviors (Administration for Children, Youth, and Families, 2002). For ease of interpretability, all externalizing scales of the CBCL used in this study (e.g., 2 year, 3 year, pre-kindergarten, and 5th grade) were recalculated to a 0 – 2 scale. In the new scale, the lowest score "1 - Not true" was recoded to 0, a score of "2" was recoded to 1, and "3 - Often true" was recoded to 2. This was done for ease of

interpretability, where “0” on the total externalizing scale signified that parents rated all questions on the externalizing scale as “0 – Not true”, meaning parents rated no externalizing behaviors present in their child. Possible externalizing behavior scores ranged from 0-22.

Caregiver depression. The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was originally a 20-item self-report measure designed to judge depressive symptoms for the general population. The EHSRE project used an abbreviated version to assess depressive symptoms in mothers at approximately 14 months and 36 months after the birth of their child, and at the prekindergarten and 5th grade measurement points. The abbreviated version of the CES-D consisted of 12 items derived from the original 20-item measure (Administration for Children, Youth, and Families, 2002). Respondents indicated how many times per week they experienced each item, using a scale ranging from “0-rare or none of the time” to “3-most or all of the time.” The internal consistency for the 20-item measure has been shown to be .85 for the general population (Radloff, 1977). The CES-D is a state rather than trait measure; as a result, test-retest reliabilities are moderate, ranging from .32 to .54 at 3 to 12 months for the 20 item measure (Radloff, 1977). The possible range of scores on the short-form is 0 to 36, with higher scores indicating more depressive symptomology. For the long form, a score of 16 or greater indicates that a person is possibly depressed, and a score of 23 or greater indicates that a person is probably depressed. A score of 15 or greater is considered high on the 12 item form (Administration on Children, Youth, and Families, 2002).

Parental stress. The Parental Stress Index-Short Form (PSI-SF; Abidin, 1995) is a measure of relative parental stress. The short form utilized in the Early Head Start Research and Evaluation Project was comprised of two scales of 12 items each; parental distress scale (PD-SF) and the parent-child dysfunctional interaction scale (PCDI-SF). Researchers were interested in testing caregiver stress involving the caregiver-child interaction. As a result, the PCDI-SF was utilized for analysis in this study. The item response format the PCDI-SF subscale ranges from 1 (strongly agree) to 5 (strongly disagree). Abidin reported a Cronbach's alpha coefficient of $r = .80$ for the PCDI-SF. The test-retest reliability for the PCDI-SF is $r = .68$. Scores on the PCDI-SF range from 12 to 60.

Poverty. Annual income was collected from participating families at each of the measurement points, baseline (point at which families entered study), 24 months, 36 months, prekindergarten, and 5th grade. The U.S. Census Bureau calculates poverty thresholds based on a family's income and the number of adults and children living in the household. For this study, poverty was calculated by taking an average of the U.S. Census Bureau's poverty guidelines over the three years that measurements were taken for each assessment time point and comparing it to what each family listed for their income and number of people living in their household. A dichotomous variable was coded for each data point, where families falling below the poverty line were given the value of one and families falling above the poverty line were given the value of zero. These dichotomous variables were added together for each assessment time point to generate an overall poverty score ranging from zero

to five. A greater score on the overall poverty variable signified that a family spent a greater amount of time in poverty.

Analysis Package

Latent growth analysis (LGA) and Structural equation modeling (SEM) were conducted using Mplus 6 software (Muthén & Muthén, 2010). Mplus is a statistical modeling program that allows analysis of longitudinal data at both single and multiple levels (Muthén & Muthén, 2010). In addition, Mplus is capable of handling missing data through various methods of analysis (e.g., maximum likelihood estimations for variables missing at random and non-missing at random; Muthén & Muthén, 2010). Finally, Mplus 6 is capable of estimating latent growth curve models and creating structural models from the latent intercepts and slopes created through the latent growth curve analysis (Muthén & Muthén, 2010).

Missing Data

In the initial collection of data and construction of the EHSRE dataset, data imputation was utilized for any participant who had less than 25% of their data missing for any given scale (e.g., Child Behaviors Checklist, Parental Stress Index; Administration for Children, Youth and Families, 2002, p. C.7). Data imputation was carried out by imputing the mean of the items answered by caregivers (Administration for Children, Youth and Families, 2002, p. C.7). In addition, the ACYF (p. C.7) states, “The proportion of scores that required imputation was fairly low—if a parent began a measure, they generally completed all of the items.” No specific numbers were given for the amount of parents that filled out portions of scales (Administration for Children, Youth and Families).

Missing data were handled utilizing the Full Information Maximum Likelihood (FIML) function in Mplus 6 (Muthén & Muthén, 2010). The FIML function calculates a “log-likelihood” of the data for each observation (Duncan, Duncan, & Strycker, 2006). This method of analysis allows for simultaneous analysis of latent growth curves and missing data (Duncan et al., 2006). Finally, Duncan and colleagues suggest that the FIML method of missing data analysis allows for acceptable estimates of standard errors when missing data are present in SEM and LGA analyses (see Table 3 for description of missing data).

Analysis Plan

Latent growth curve analysis. A latent growth curve was utilized in the SEM framework to estimate trajectories for all members of the sample and investigate the relationships between the constructed latent growth curves and poverty predictor variable (Duncan, Duncan, & Stryker, 2006). Latent growth curves are constructed by creating individual trajectories from observed variables that are measured at different time points (Duncan et al., 2006; Wickrama, Conger, Lorenz, & Jung, 2006). Latent variables are defined from these trajectories and describe the initial level of the measured variable (e.g., intercept) and change in the measured variable over time (e.g., slope) (Duncan et al., 2006). More plainly put, the intercept represents the score for each participant at the initial measurement point of the study (e.g., scores at 14 months for caregiver depression). The slope represents the change from the initial score over the course of the subsequent measurements (e.g., change from caregiver depression at 14 months to 5th grade measurement).

A SEM framework was utilized to identify the manner in which the slope and intercept of one growth curve related to the slope and intercept of another growth curve and/or predictor variables. Willet and Sayer (1994) suggested that when covariance between growth estimates and other growth measures, predictors, or outcome indicators is significant, it can be assumed that the relationship is systematic and not random. When the growth curve indicators were significant, the slopes and intercepts of the latent growth curve models for social emotional development, maternal depression, and parental stress were analyzed in an SEM model.

Preliminary analysis. To ensure the assumptions necessary to run a latent growth curve and SEM are met and the suggested statistical analyses can be performed the proper diagnostic procedures were undertaken (e.g., scatterplots were investigated to measure ensure normality). If data did not meet the necessary assumptions, data manipulation procedures were utilized (e.g., variance stabilization transformations) to conform data to the assumptions (when possible).

Analysis of each research question was comprised of several steps (i.e., creating latent growth curves, creating poverty variable). Below a description is provided of the specific analysis procedures for each research question.

Research Question 1: What effect does the length of time living in poverty play in children's social and emotional development from early childhood to 5th grade?

Analyses to address this research question were conducted utilizing latent growth curve modeling. Researchers have demonstrated that prolonged poverty has

a negative effect on social emotional development. However, most of the research in this area has focused on specific cross-sectional data or measured social emotional development as a one-time outcome variable. Latent growth curve analysis is ideal for investigating the social emotional developmental trajectory of children living in persistent poverty because it allows for the investigation of time-variant and time-invariant variables (Duncan et al., 2006). A time-variant variable (e.g., income, stress) is one that shows variation (i.e., changes) over the course of time. A time-invariant variable (e.g., gender, ethnicity) is one that does not vary (i.e., does not change) over the course of time (Duncan et al., 2006).

Social emotional development was defined operationally as scores on the CBCL externalizing subscale. The CBCL externalizing scale, taken at the 2-year-old, 3-year-old, pre-kindergarten, and 5th grade data points, was utilized to construct trajectories. The four CBCL measures are continuous and have been shown to be both reliable and valid on nationally representative samples of children (Achenbach, 1991; Achenbach & Rescorla, 2000). The predictor variable for this analysis was the constructed poverty variable. Mean slopes and an intercept were calculated for the children's CBCL scores.

Research Question 2: What role does the existence of caregiver depressive symptoms play in mediating the effects of poverty on children's social and emotional development from early childhood to 5th grade?

Analysis of this research question was conducted utilizing latent growth curve modeling. Research that has investigated maternal depression as a potential mediating variable of poverty on the social emotional development of children is

present but has not utilized an LGA model to investigate the connection between these constructs. A growth curve analysis allows for a more in-depth understanding (e.g., understanding if change over time in one variable influences or is associated with change over time of another variable) of how poverty, maternal depression, and social emotional development are related over the course of the measurement periods.

The latent growth curve trajectory was created for maternal depression utilizing the CES-D scores taken at 14 months, 3 years, pre-kindergarten, and 5th grade. The constructed poverty variable was designated as a predictor variable. A trajectory was calculated for social emotional development by utilizing the CBCL scores at the 2 year, 3 year, pre-kindergarten, and 5th grade data points. A model was constructed to examine if the effects of poverty on social emotional development were mediated by maternal depression.

Research Question 3: What role does the existence of caregiver stress play in mediating the effects of poverty on children's social and emotional development from early childhood to 5th grade?

Analysis of this research question was conducted utilizing latent growth curve modeling. The mediating effect of parental stress between poverty and social emotional development has been only minimally investigated to date. Research that has been conducted on the mediating effects of parental stress on poverty and social emotional development has generally been on cross-sectional data sets. However, the body of research suggests that greater time in poverty is related to greater parental stress, and greater parental stress is related to poorer social

emotional development. As the data set used in this study is longitudinal in nature, latent growth curve analysis allows the researcher to investigate the relations among poverty, parental stress, and social emotional development over time.

A latent growth curve trajectory was calculated utilizing the Parent –child dysfunctional interaction scale (PCDI-SF) scores taken at 2 years, 3 years, pre-kindergarten, and 5th grade. The constructed poverty variable was designated as a predictor variable. A trajectory was calculated for social emotional development by utilizing the CBCL scores at the 2 year, 3 year, pre-kindergarten, and 5th grade data points. A model was constructed where the effects of poverty on social emotional development will be mediated by parental stress.

Research Question 4: What role does the existence of caregiver stress play in mediating the effect of maternal depression on children's social emotional development from early childhood to 5th grade?

Analysis of this research question was conducted utilizing latent growth curve modeling. The mediating effects of parental stress on the relationships between maternal depression and social emotional development have been investigated in the literature. However, little research has been conducted on longitudinal, panel data sets.

Latent growth curve trajectories were constructed for maternal depression, parental stress, and social emotional development. A model was constructed through which the effects of maternal depression on social emotional development were mediated by parental stress. Parental stress trajectories were created from PCDI-SF scores at the 2 year, 3 year, pre-kindergarten, and 5th grade data points.

Maternal depression trajectories were created by utilizing scores from the CES-D at the 14 month, 3 year, pre-kindergarten, and 5th grade data points. Social emotional development trajectories were created using scores from the CBCL at the 2 year, 3 year, pre-kindergarten, and 5th grade data points.

Fit Indices

Fit indices are metrics utilized to assess how well a model is able to reproduce the data utilized from a studies sample (Bollen & Long, 1993). The more closely a model reproduces that data given, the better fit a model will be, and the closer fit indices will be to what is deemed “acceptable” in the literature (Hayduk, Cummings, Boadu, Pazderka-Robinson, & Boulianne, 2007). Several fit indices were utilized to judge the models presented in this study. The model χ^2 is reported in this study as it is generally reported whenever a SEM model is estimated (Hayduk et al., 2007). In theory a good model fit returns a *p-value* greater than .05 (Barrett, 2007). Research suggests that χ^2 not be used as a sole measure of goodness of fit (Bentler & Bonnett, 1980; Hooper, Coughlan, & Mullen, 2008). A major reason for this suggestion is that the χ^2 model fit index is often small enough (e.g., $p < .05$) that null hypothesis is rejected when sample sizes are large (Bentler & Bonnett, 1980; Hooper et al., 2008). However, Hayduk and colleagues assert that it is important to report χ^2 , degrees of freedom, and *p-value* for the sake of the information gleaned from the reporting of these statistics.

The root mean square error of approximation (RMSEA) was developed by Steiger in 1990. The RMSEA judges the acceptability of model fit on how well parameter estimates fit a population covariance matrix (Byrne, 1998). The RMSEA

ranges from 0 to 1 (Hooper, Coughlan, & Mullen, 2008). Literature suggests that an RMSEA below .05 is a superbly fitting model, an RMSEA between .05 and .06 is a good fitting model, an RMSEA between .06 and .08 is a fair fitting model, an RMSEA between .08 and .10 is a mediocre fit, and anything above .10 is deemed unacceptable (Hooper, Coughlan, & Mullen; Hu & Bentler, 1999; MacCallum et al., 1996; Steiger, 2007).

The standardized root mean square residual (SRMR; Hu & Bentler, 1999) is the square root of the difference between the standardized residuals of the hypothesized and sample covariance matrices (Hooper, Coughlan, & Mullen, 2008). SRMR values can range from 0 to 1, where a value near or below .05 is deemed a good fit and values below .08 are deemed acceptable fits (Hooper et al., 2008; Diamantopoulos & Sigauw, 2000).

The χ^2 , RMSEA, and SRMR were chosen as the primary indicators of fit for this study based on the recommendation by Hu and Bentler (1999), Kline (2005), and Hooper et al. (2008), whose research agreed on utilizing a combination of χ^2 , RMSEA, and SRMR. Hooper and colleagues suggest that this combination is robust in the face of sample size, parameter estimates, and model misspecification.

Modification Indices

After each latent growth curve and model were run, and investigation of the modification indices was completed. Modification indices are provided by Mplus 6 (Muthén & Muthén, 2010) as a means to improve the overall fit of a specific model (Saghaei & Ghasemi, 2009). Modification indices identify specific paths in the model, that when added, lead to an improved fit of the model (Saghaei & Ghasemi;

MacCallum, 1986). The prevailing body of literature suggests that modification indices only be utilized when a path between the two variables in question makes theoretical sense (MacCallum, Duncan, Duncan, & Stycker, 2006). As a result, in this study a process was used where whichever path between two variables yield the greatest benefit to the fit indices, and also, made theoretical sense was utilized.

CHAPTER 4 RESULTS

Descriptive Statistics

Descriptive statistics were estimated for all of the observed variables utilized in the analysis for study. A comprehensive description of the means, standard deviations, minimum values, maximum values, and missing values can be found in Table 2. Specifically, all data were present for all measures of the CBCL and no missing data methods were utilized. For poverty, caregiver depression, and caregiver stress, the FIML method for missing data was utilized. Correlations between all observed variables can be found in Table 2.

The initial latent growth curves created for this study (scales for externalizing behaviors, caregiver depression, and parental stress) will be presented first in the results section. A comparison of externalizing behaviors by gender will be discussed following the presentation of the initial latent growth curves. Finally, findings based on the proposed analyses for each research question will be reported.

Table 2

Zero-Order Correlations Between Observed Measurement Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Ext-2	-												
2. Ext-3	-.050	-											
3. Ext-pk	-.002	.015	-										
4. Ext- 5 th	-.002	.029	.032	-									
5. Dep-14	.010	.022	-.035	.029	-								
6. Dep-3	.013	.032	.019	-.053	-.006	-							
7. Dep-pk	.012	-.003	-.015	.014	-.048	-.011	-						
8. Dep-5 th	-.063*	.070*	-.005	.370**	-.029	-.020	.009	-					
9. PSI-14	-.034	.004	-.024	.029	.024	.134**	-.056	.014	-				
10. PSI-24	-.013	.106**	-.016	-.017	.088*	.200**	-.104**	.025	.462**	-			
11. PSI-36	-.017	.123**	-.004	-.044	.002	.273**	-.037	.026	.439**	.558**	-		
12. PSI-5 th	.31	.053	.015	.572**	.027	-.044	-.014	.300**	.005	-.014	-.011	-	
13. Pov	-.043	.008	.016	.107**	.027	-.024	.029	.112*	-.001	.018	-.015	.044	-

Note: Measures abbreviations are - Ext-2: Externalizing behaviors at 2 years; Ext-3: Externalizing behaviors at 3 years; Ext-pk: Externalizing behaviors at pre-kindergarten; Ext-5th: Externalizing behaviors at 5th grade; Dep-14: Caregiver depression at 14 months; Dep-36: Caregiver depression at 36 months; Dep-pk: Caregiver depression at pre-kindergarten; Dep-5th: Caregiver depression at 5th grade; PS-14: Caregiver stress at 14 months; PS-24: Caregiver stress at 24 months; PS-36: Caregiver stress at 36 months; PS-5th: Caregiver stress at 5th grade; Pov: Cumulative poverty score. * $p < .05$; ** $p < .01$.

Table 3

Descriptive Statistics for Constructed Variables

Variable	Estimated Mean	Standard Deviation	Min	Max	Missing
Externalizing behaviors					
2 year	15.07	7.35	0	42	0
3 year	14.44	7.35	0	40	0
Pre-kindergarten	12.57	7.87	0	41	0
5 th grade	8.82	7.97	0	44	0
Intercept	15.07				
Slope	-6.25				
Caregiver Depression					
14 months	8.65	7.17	0	36	163
3 year	8.43	6.32	0	36	245
Pre-kindergarten	8.08	6.85	0	36	50
5 th grade	7.45	6.75	0	36	1
Intercept	8.65				
Slope	-1.2				
Caregiver Stress					
14 months	17.36	5.75	12	50	149
2 year	17.21	5.51	12	50	267
3 year	17.12	6.42	12	56	279
5 th grade	16.0	4.66	12	36	0
Intercept	17.36				

Table 3 continued

Variable	Estimated Mean		Standard Deviation		Min	Max	Missing
Slope	-1.36						
Poverty	2.38		1.06		1	5	
Distribution of time in poverty	0 MPIP	1 MPIP	2 MPIP	3 MPIP	4 MPIP	5 MPIP	
# of participants	26	197	374	308	141	21	

MPIP = Measurement Points In Poverty

Latent Growth Curves

Externalizing behaviors. A latent growth curve was constructed for externalizing behaviors using the CBCL measurements taken at the 2-year, 3-year, prekindergarten, and 5th grade measurement points (see Figure 2). A complete set of data was collected for each measurement point of the CBCL; as a result no missing data for the estimation of externalizing behaviors growth curve were present. The fit indices for the growth curve model for externalizing behaviors were $\chi^2 (7) = 35, p < .001$; RMSEA = .061; SRMR = .05. The χ^2 was significant; however, large sample sizes often lead to significant χ^2 results regardless of the model fit (Bentler & Bonnett, 1980). The RMSEA of .061 falls into the good fit range and SRMR of .05 is in the superb fit range described by Hooper and colleagues (2008).

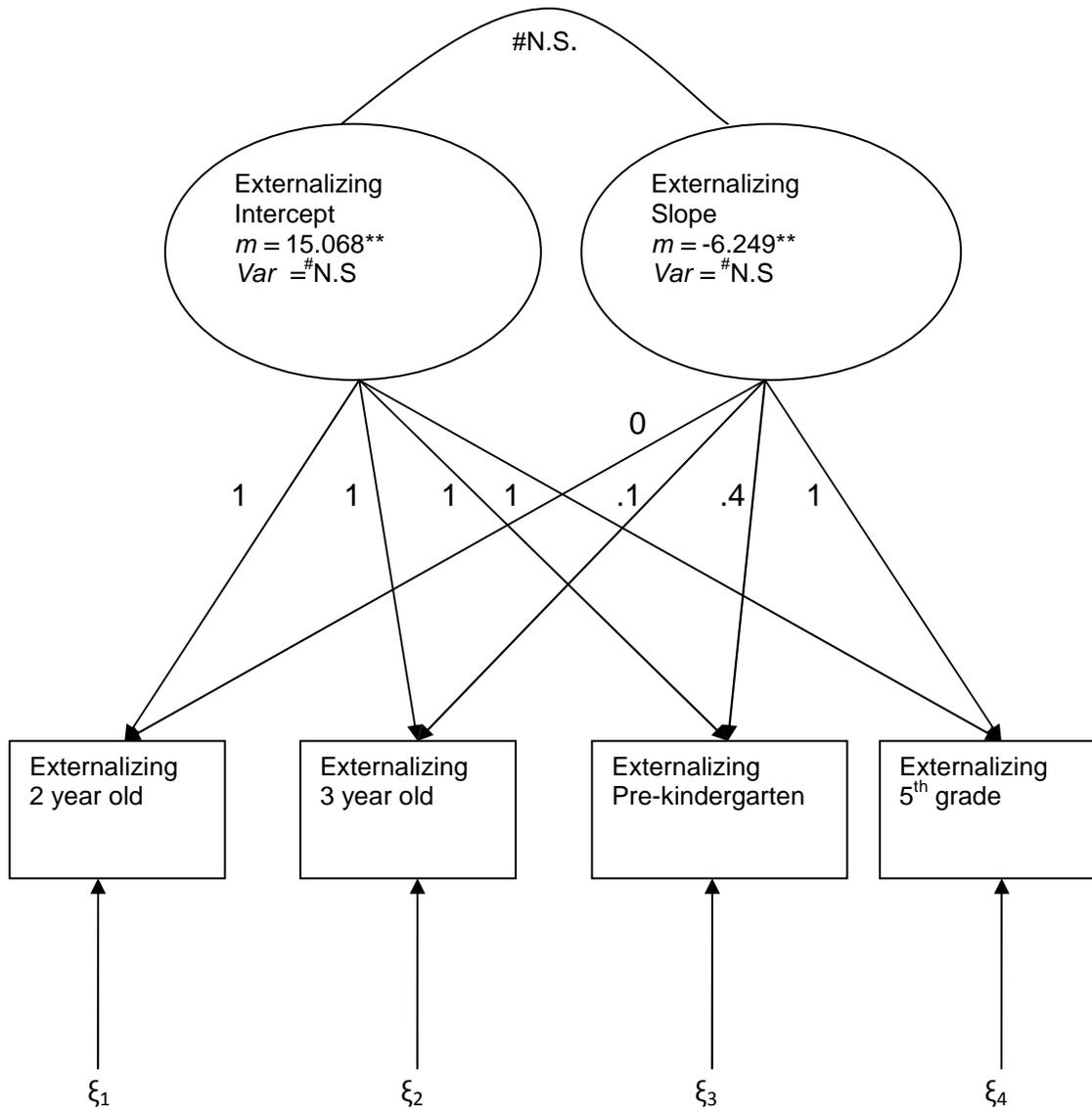


Figure 2. Trajectories of Externalizing Behaviors

$\chi^2(7) = 35$

RMSEA = .061

SRMR = .05

* $p < .05$; ** $p < .01$; *** $p < .001$;

#N.S. = non-significant

The initial mean level of externalizing behaviors (2 years old) was $M = 15.07$ ($p < .001$). The rate of change for externalizing behaviors of children between 2

years old and 5th grade was negative, with a slope of $M = -6.429$ ($p < .001$; Figure 2). These findings are in line with cited research that suggests children typically exhibit their highest levels of externalizing behaviors at younger ages (around 2 years old; Bongers, Koot, Vander Ende, & Verhulst, 2003) and then see a decrease in these behaviors as they mature (Figure 3) (Bongers, Koot, Vander Ende, & Verhulst, 2004; Gilliom & Shaw, 2004; Kiesner, 2002).

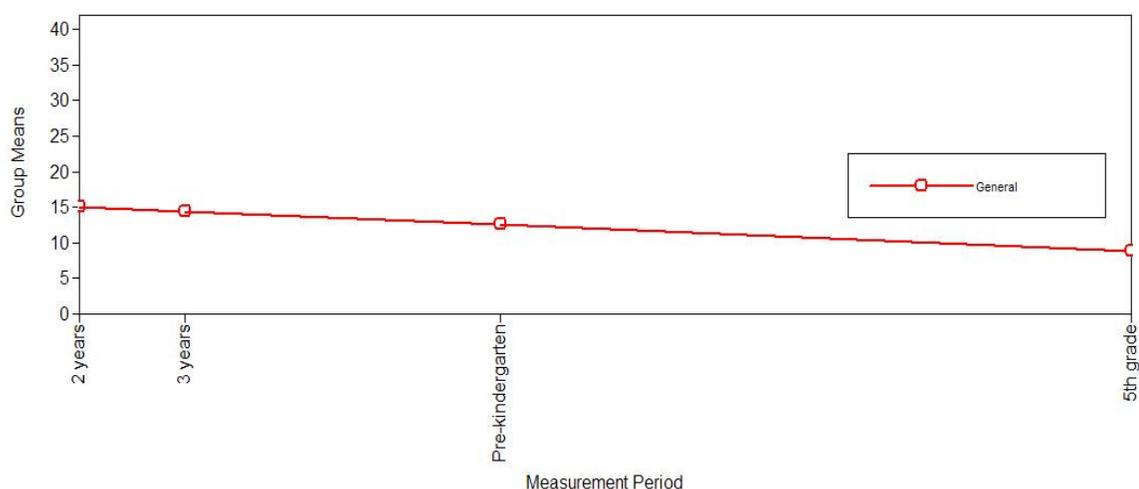


Figure 3. Externalizing Behaviors Estimated Group Means

Caregiver depression. A latent growth curve measure was constructed utilizing the CES-D measures taken at 14 months, 3 years, prekindergarten, and 5th grade (see Figure 4). The fit indices for the caregiver depression growth curve model were $\chi^2(7) = 18.49$, $p < .01$; RMSEA = .039; and SRMR = .035. Both the RMSEA and the SRMR were well below the .05 standard describing a superb or good fit set by Hooper and colleagues (2008), leading to the conclusion that this curve is an acceptable fit. The results showed that the mean level of caregiver depression at 14 months was $M = 8.65$, ($p < .001$). The mean for the slope was $M = -1.2$, ($p < .001$;

Figure 5), suggesting a small but evident decrease in maternal depression over time.

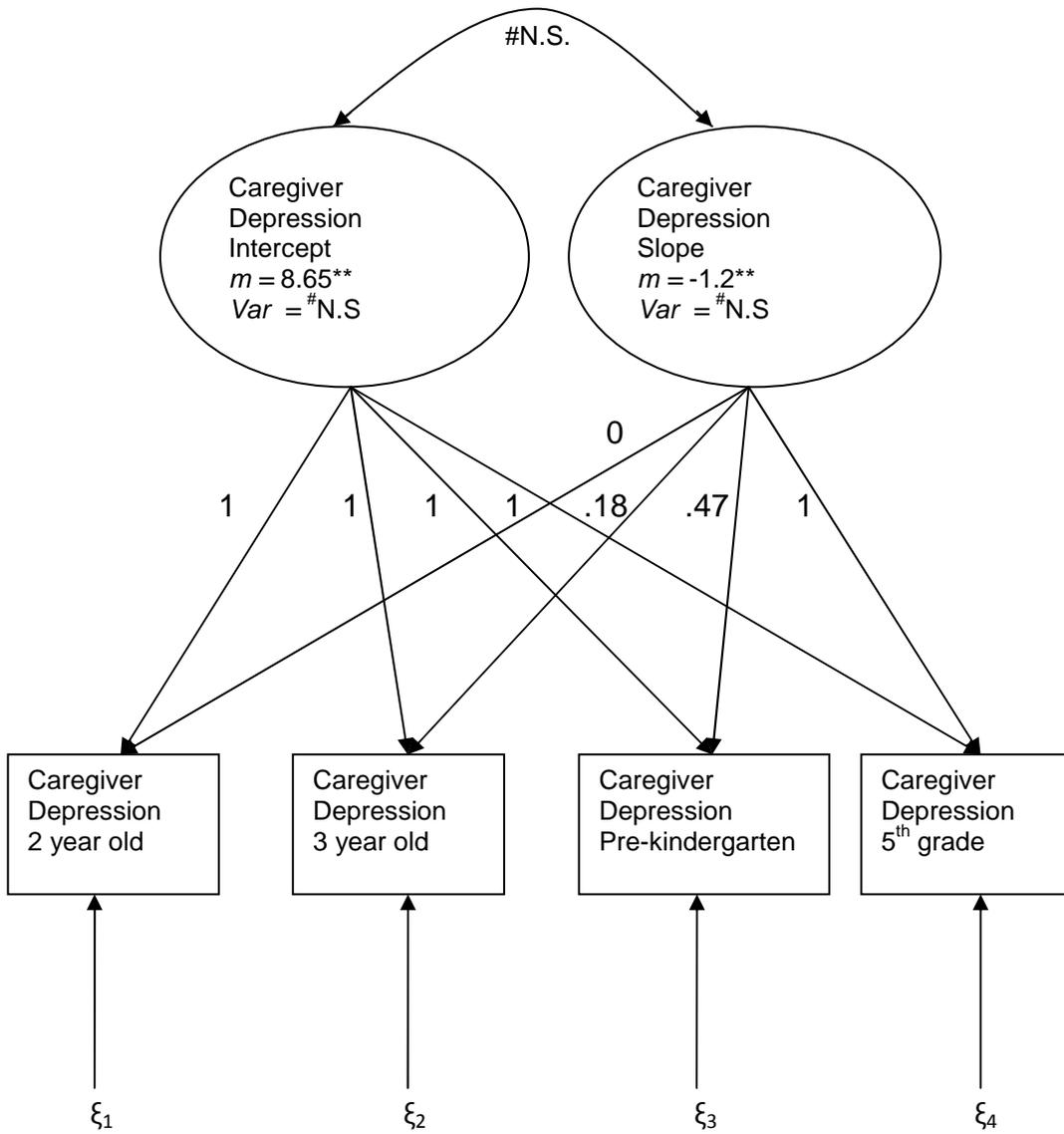


Figure 4. Trajectories of Caregiver Depression

$\chi^2(7) = 18.49$

RMSEA = .039

SRMR = .035

* $p < .05$; ** $p < .01$; *** $p < .001$;

#N.S. = non-significant

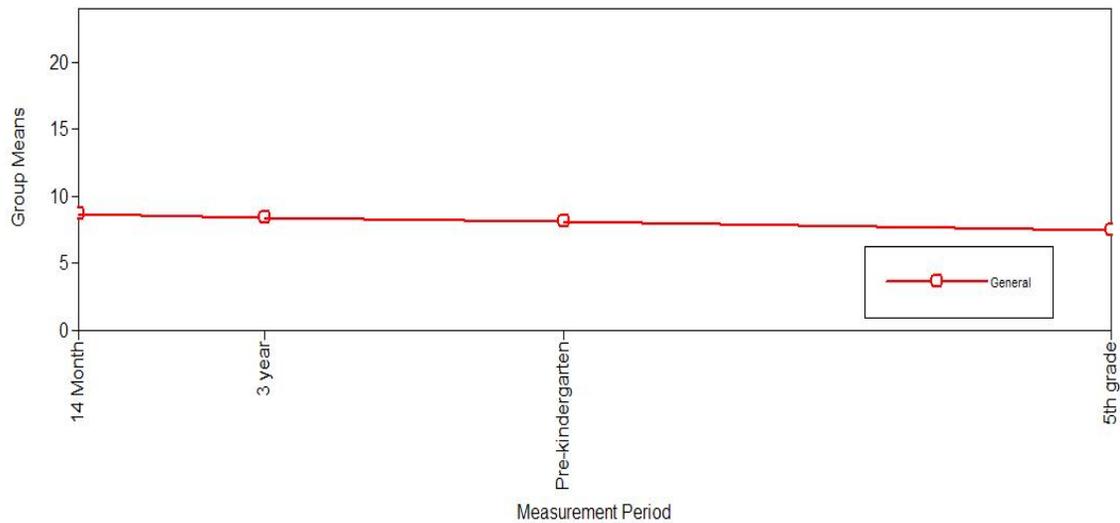


Figure 5. Caregiver Depression Estimated Group Means

Caregiver stress. A latent growth curve was created for parental stress utilizing the PSI-SF measurements taken at the 14-month, 2-year-old, 3-year-old, and 5th grade data points (see Figure 6). Model fit indices for the caregiver stress latent growth curve model were, $\chi^2_{(7)} = 27.31$, $p < .001$; RMSEA = .087; and SRMR = .04. The RMSEA for this model was in the range typically described as “mediocre”, however with a SRMR = .04 (deemed a good fit) this model was considered acceptable (Hooper, Coughlan, & Mullen, 2008).

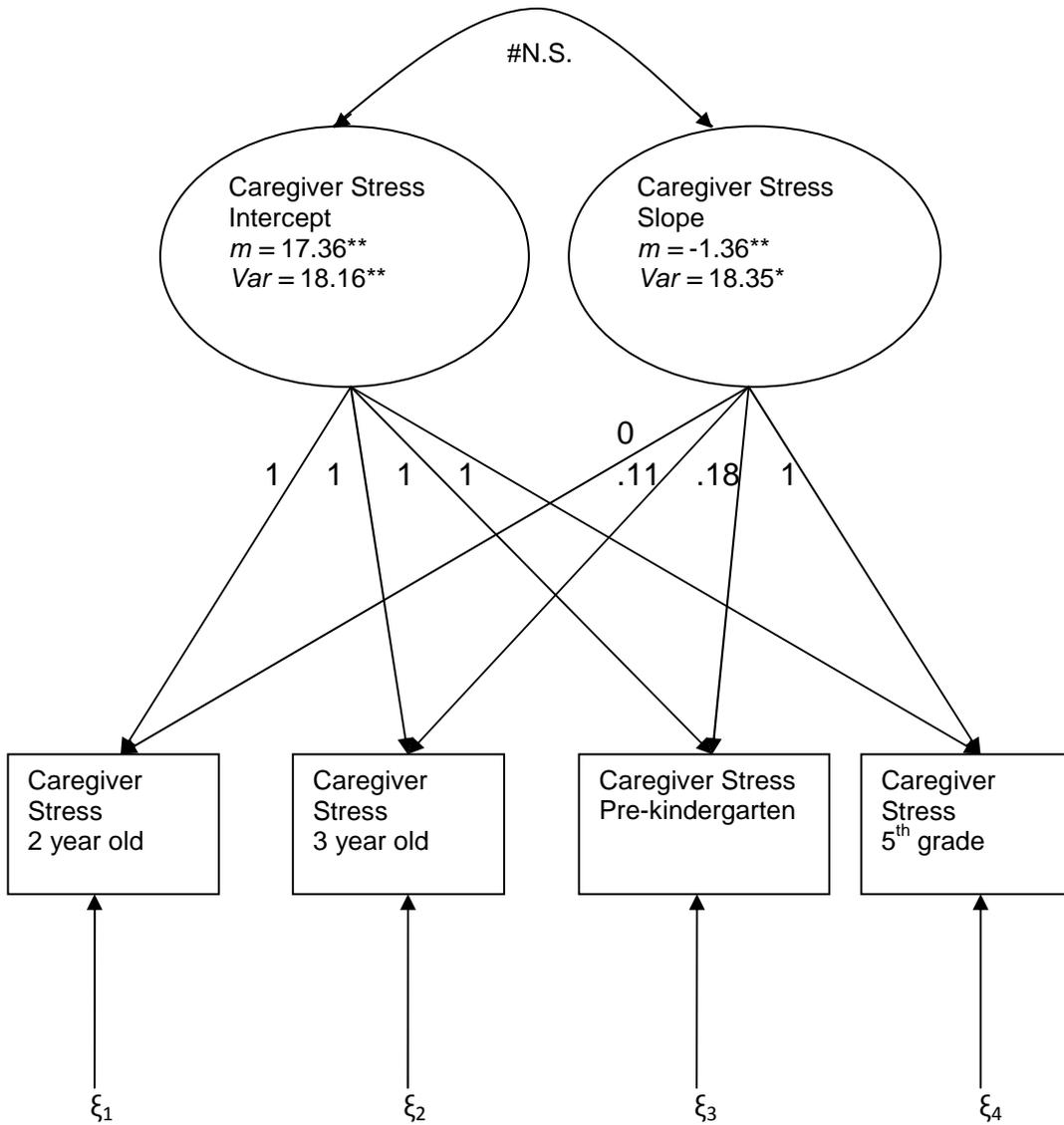


Figure 6. Trajectories for Caregiver Stress

$\chi^2_{(7)} = 27.31$

RMSEA = .087

SRMR = .04

* $p < .05$; ** $p < .01$; *** $p < .001$;

#N.S. = non-significant

The results showed that the mean initial level for parental stress was $M = 17.36$, ($p < .001$). The mean variance in initial level was significant at $S = 18.161$, ($p < .001$), suggesting that there was a large inter-individual difference in parental stress at initial measurement. The mean change overtime for parental stress was $M = -1.36$, ($p < .001$; Figure 7), suggesting that overall parental stress decreased significantly over the course of the measurements. The mean variance for the slope of parental stress was significant at $S = 18.345$, ($p < .05$), suggesting that there was significant amount of variation between parents in their stress levels overtime.

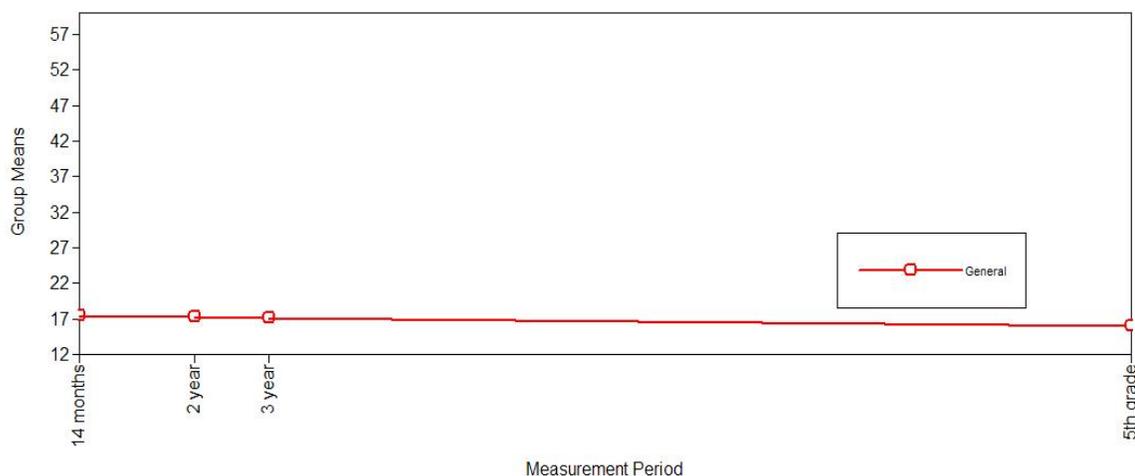


Figure 7. Caregiver Stress Estimated Group Means

Comparing Gender

Previous researchers have identified a difference in externalizing behaviors between genders early in development (around 2 years), and a gradual convergence between genders in externalizing behaviors as boys and girls age (Bongers, Koot Vender Ende, & Verhulst, 2004; Prinstein & La Greca, 2004). Though a research question was not posed about the differences between boys and girls on

externalizing behaviors, it was important to investigate the difference between genders for the sake of a complete understanding of the sample. As a result, a comparison of externalizing behaviors latent growth curves by gender was carried out to identify differences in development of externalizing behaviors by gender. Separate growth curves for males and females were estimated to identify differences in estimated intercepts and slopes. Model fit indices were reported as, $\chi^2_{(10)} = 37.6$, $p < .001$; RMSEA = .073, and SRMR = .052. The χ^2 for the hypothesized model was significant, however research has suggested that large sample sizes tend to increase the likelihood of finding significant χ^2 values (Bentler & Bonnett, 1980), additional fit indices were utilized to decide on the acceptability of the model fit. The RMSEA fell into the acceptable range and the SRMR was near the threshold for a superbly fitting model. As a result, the model was deemed a good fit.

Small differences were observed in female intercept ($M = 15.32$; $p < .001$) and slope ($M = -6.51$; $p < .001$) versus male intercept ($M = 14.87$, $p < .001$) and ($M = -6.07$; $p < .001$), meaning that males had an initially lower level of externalizing behaviors than girls, and girls had a steeper negative slope. This suggests that in the early childhood years girls showed a small but significantly higher level of externalizing behaviors, but over the course of the measurement time points the difference between occurrences of externalizing behaviors became less because of the girls' steeper slope (see Figure 8).

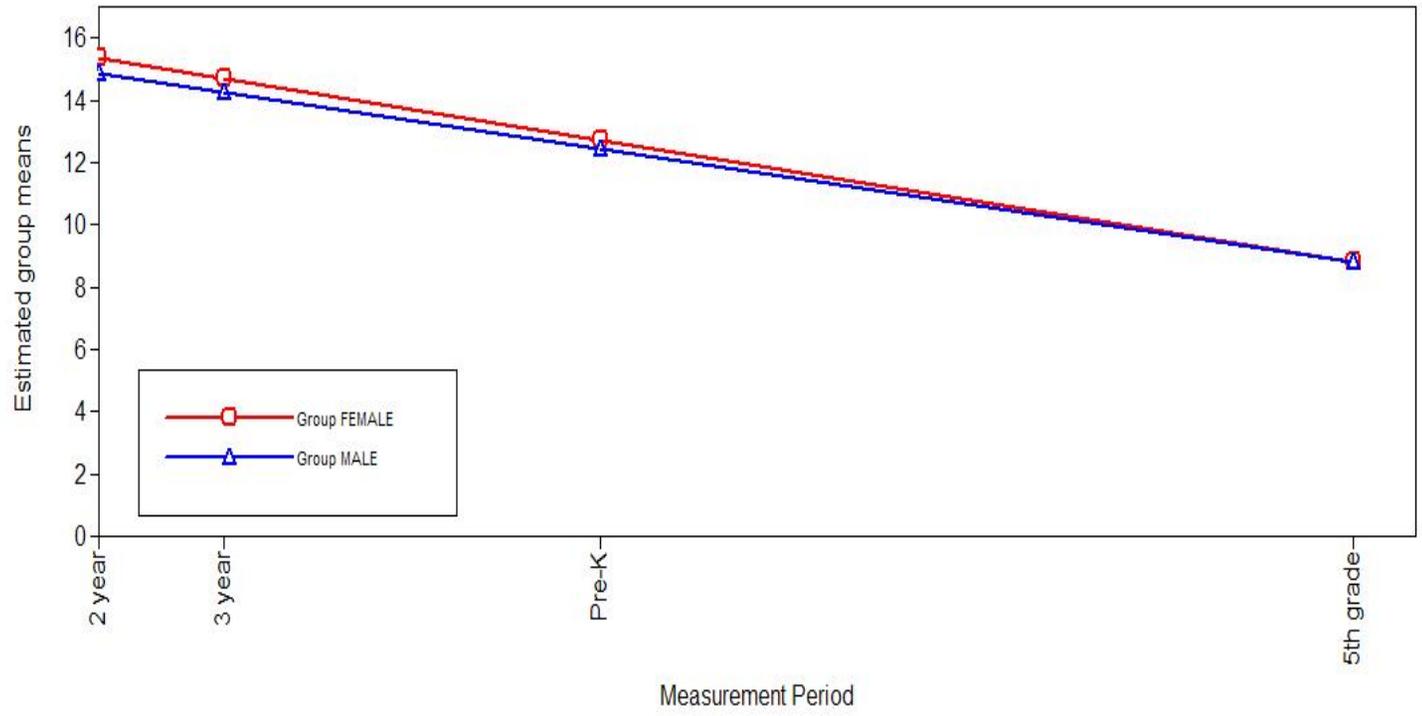


Figure 8. Estimated Means for Boys' and Girls' Externalizing Behaviors

These findings are counter to recent findings that suggest males initially are higher in externalizing behaviors than females, but eventually both genders become equal by middle childhood and early adolescence (Bongers, Koot, Vander Ende, & Verhulst, 2004; Gilliom & Shaw, 2004; Kiesner, 2002). Bongers and colleagues' (2003) research findings suggest that in early childhood (ages 3-4) boys exhibit almost double the level of externalizing behaviors as girls. However, the differences found in this study are small when compared to the findings in Bongers and colleagues' research. Also, considering the fact that a large sample size was utilized in this research project (which increases the likelihood of significant findings; Duncan, Duncan, & Stycker; 2006), suggesting a "statistical" difference as opposed to a "meaningful" difference was present. More plainly put, the difference observed between genders is relatively meaningless in a real world setting and more a function of the large sample size.

Duncan and colleagues (2006) suggest utilizing a constrained slope and intercept that matches the slope and intercept for the overall population in conjunction with the simultaneous test method (used above) to gain a more complete picture of the differences between two groups. If intercepts and slopes are close in the simultaneous model and an acceptable fit is derived in the constrained model, it may be presumed that slopes and intercepts for the groups are extremely similar (Duncan et al., 2006). As a result, a model was estimated in which the slopes and intercepts for each group were constrained to match the slope and intercept for all members of the population (e.g., intercept $M = 15.09$; slope $M = -6.27$). The fit indices for this model suggested an acceptable fit, $\chi^2_{(12)} = 39.89$, $p < .001$, RMSEA =

.066, and SRMR = .055. The χ^2 slightly increased in the constrained model compared to the simultaneous model for gender, the RMSEA decreased, and the SRMR remained relatively stable, leading to the decision that the constrained model fit the data equally well as the simultaneously estimated model. As a result of the slope and intercepts for both genders being extremely close in the simultaneously estimated model and the acceptable fit of the constrained model, no testing of gender in the subsequent analyses was conducted.

Analysis of Research Questions

Research Question 1: What effect does the length of time living in poverty play in children's social and emotional development from early childhood to 5th grade?

Research question 1 was answered by creating a latent growth curve model for externalizing behaviors measured by the CBCL at the 2 year old, 3 year old, pre-kindergarten, and 5th grade measurement points and the constructed poverty variable. Using an SEM framework, the slope and intercept of the externalizing behaviors growth curve were regressed on poverty (see Figure 9). The fit indices for this model were $\chi^2_{(9)} = 35.69$, $p < .001$; RMSEA = .053, and SRMR = .042. The RMSEA and SRMR were in the “good fit” range proposed by Hooper and colleagues (2008) and the model fit was deemed acceptable.

The results showed a significant relationship between poverty and the slope of externalizing behaviors ($b = 1.35$; $p < .01$). This result suggests that in the study sample, for every one unit increase in poverty there is a 1.35 unit increase in the slope of externalizing behaviors scores. Put in simpler terms, the longer children

spend in poverty the more likely they are to exhibit externalizing behaviors over time. No significant result was observed in the relationship of poverty to the intercept of externalizing behaviors. This means that at the initial measurement of externalizing behaviors, poverty had not contributed to the initial levels of externalizing behaviors in a statistically significant way.

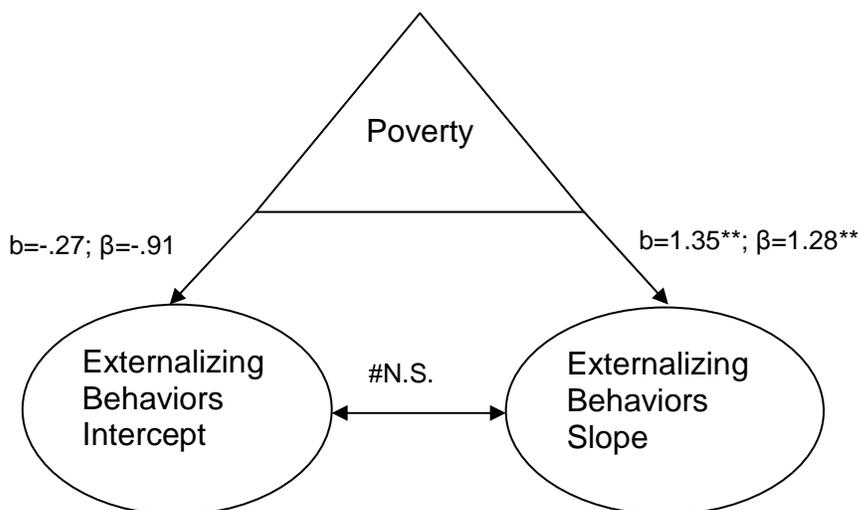


Figure 9. Effect of Poverty on Externalizing Behaviors

$$\chi^2_{(9)} = 35.69$$

$$\text{RMSEA} = .053$$

$$\text{SRMR} = .042$$

$$*p < .05; **p < .01; ***p < .001;$$

#N.S. = non-significant

Research Question 2: What role does the existence of caregiver depressive symptoms play in mediating the effects of poverty on children's social and emotional development from early childhood to 5th grade?

The mediating effect of caregiver depressive symptoms on the relationships between poverty and externalizing behaviors was investigated utilizing an SEM framework in which the slope and intercept of caregiver depression were regressed

on poverty and the slope and intercept of externalizing behaviors were regressed on the slope and intercept for caregiver depression (see Figure 10). Regressing the slope and intercept of one variable on another variable's slope and intercept demonstrates how much change in one variable is associated with the change in another variable. When the slope of externalizing behaviors is regressed on the slope of caregiver depression, the results indicate that change in caregiver depression is associated with a specific amount of change in externalizing behaviors. The model fit indices were $\chi^2_{(29)} = 72.55$, $p < .001$ versus a baseline $\chi^2_{(36)} = 207.15$, $p < .001$; RMSEA = .038, and SRMR = .036. The RMSEA and SRMR were in the superb and good fit range (respectively) proposed by Hooper and colleagues (2008), which suggests an acceptable model fit. Finally, an investigation of the modification indices suggested that externalizing behavior scores at the grade 5 measurement point be correlated with the caregiver depression scores at the grade 5 measurement point. Since these measurements were conducted at the same time and were thought to be related these measurements were correlated.

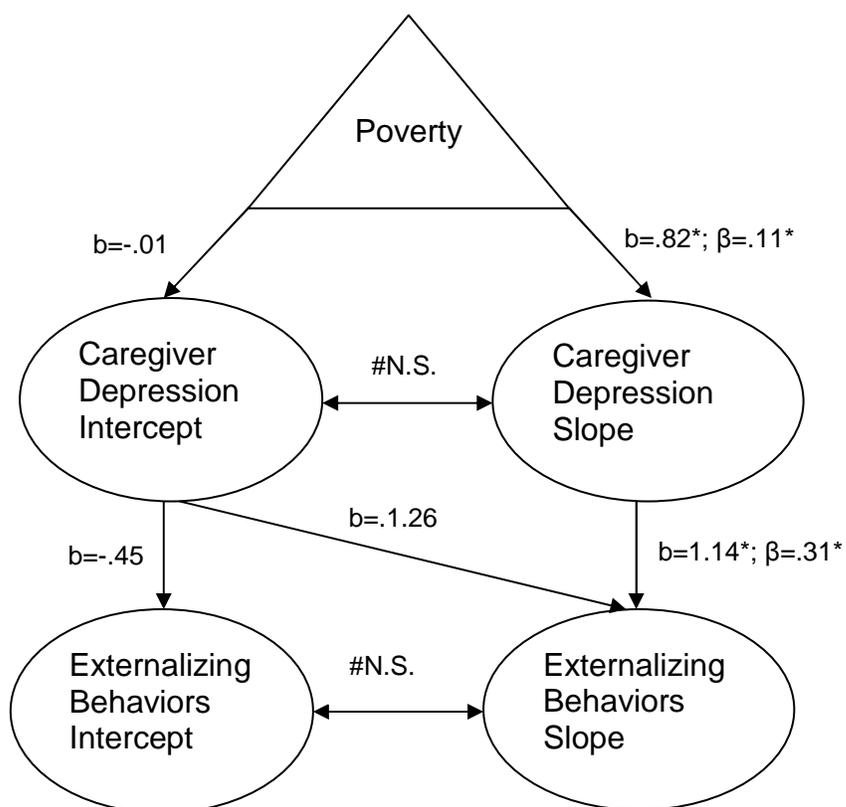


Figure 10. Mediating Effect of Caregiver Depression on Poverty and Externalizing Behaviors

$$\chi^2_{(29)} = 72.55$$

$$\text{RMSEA} = .038$$

$$\text{SRMR} = .036$$

$$*p < .05; **p < .01; ***p < .001;$$

#N.S. = non-significant

As stated above, a significant relationship existed between poverty and the slope of externalizing behaviors ($b = 1.35$; $p < .01$). The current analysis identified significant relationship between the slope of caregiver depression and poverty ($b = .82$; $p < .05$), meaning that a one unit increase in the poverty variable is associated with a .82 unit increase in the slope of CES-D (caregiver depression) scores. In addition, a significant relationship between the slope of caregiver depression scores and the slope of externalizing scores was identified ($b = 1.14$; $p < .05$), suggesting

that a one unit increase in the slope of caregiver depression scores predicts a 1.14 unit increase in the slope of externalizing behaviors scores over time. Finally, the significant relationship between poverty and the slope of externalizing behavior scores (found in previous analyses; Figure 6) was no longer significant, implying that a change in maternal depression over time is fully mediating the effect of prolonged poverty on the slope of externalizing behaviors over time. This means that time spent in poverty is predicting a change in the slope of caregiver depression, as opposed to the relationship between initial level of caregiver depression and poverty where no significant relationship was found. In turn, a change in the slope of caregiver depression is predicting a change in the slope of externalizing behaviors. As a result, poverty is related to externalizing behaviors through an intermediary variable (caregiver depression).

Research Question 3: What role does the existence of caregiver stress play in mediating the effects of poverty on children's social and emotional development from early childhood to 5th grade?

The mediating effect of caregiver stress on the relationships between poverty and externalizing behaviors was investigated utilizing a SEM frame work in which the slope and intercept of caregiver stress were regressed on poverty, and the slope and intercept of externalizing behaviors were regressed on the slope and intercept for caregiver stress (see Figure 11). To investigate the relationship between poverty, caregiver stress, and externalizing behaviors a structural equation model was constructed where the change in poverty associated with the change in caregiver stress was investigated, and the change in caregiver stress associated with the

change in externalizing behaviors was investigated. The model fit was acceptable with the $\chi^2_{(29)} = 178.28$, $p < .001$ versus a baseline $\chi^2_{(36)} = 936.24$, $p < .001$; RMSEA = .069, and SRMR = .064. The RMSEA and SRMR were both in the acceptable fit range proposed by Hooper and colleagues (2008), leading the researchers to deem them acceptably fitting models.

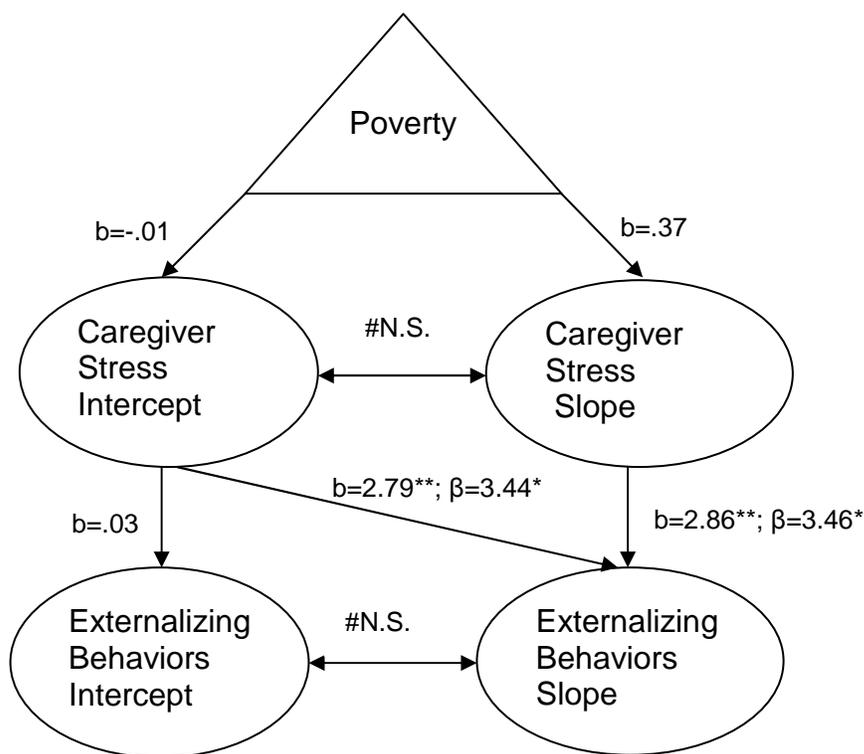


Figure 11. Mediating Effect of Caregiver Stress on Poverty and Externalizing Behaviors

$$\chi^2_{(29)} = 178.28$$

$$\text{RMSEA} = .069$$

$$\text{SRMR} = .064$$

$$*p < .05; **p < .01; ***p < .001;$$

#N.S. = non-significant

Previous analysis (Figure 9) suggested that a significant relationship between poverty and the slope of externalizing behaviors ($b = 1.35$; $p < .01$), however the current model did not identify a significant relationship between poverty and the

intercept or slope of parental stress ($b = -.01$; $p = .96$; $b = .37$; $p = .18$ respectively). A significant relationship between the slope of caregiver stress scores and the slope of externalizing behaviors scores was identified ($b = 2.86$; $p < .01$), suggesting that a one unit increase in the slope of caregiver stress scores (PCDI-SF) predicts a 2.86 change in the slope of externalizing behaviors scores over time. In addition, the initial level of parental stress scores also significantly predicted an increase in the slope of externalizing behavior scores ($b = 2.79$; $p < .01$), suggesting that a one unit increase in initial PCDI-SF score (caregiver stress) predicts a 2.79 point increase in the slope of externalizing behavior scores. Finally, no significant relationship between the initial level of caregiver stress scores and initial level of externalizing behaviors scores was found ($b = .03$; $p = .46$). This means that initial levels of stress reported by parents (stress at 14 months) did not change in a predictable manner with the initial level of externalizing behaviors (externalizing behaviors at 2 years). These results suggest that experiencing caregiver stress over time is more important to the existence of externalizing behaviors over the course of a child's lifetime than experiencing caregiver stress early and for a short period of time.

Research Question 4: What role does the existence of caregiver stress play in mediating the effect of caregiver depression on children's social emotional development from early childhood to 5th grade?

The mediating role of caregiver stress on the relationships between caregiver depression and externalizing behaviors was investigated utilizing an SEM framework where a large, inclusive, and parsimonious model was constructed (Figure 12) that included all variables used in previous analyses (e.g., poverty, slope and intercept

for caregiver depression, slope and intercept for parental stress, and slope and intercept for externalizing behaviors). The advantage of this model is that it provides an overall view of how all variables are related to each other (e.g., externalizing behaviors, caregiver stress, caregiver depression, and poverty) in the least complex model possible (i.e., following the principle of parsimony). In addition, no published research exists that investigates these variables' relationship to each other in the proposed manner. Finally, previous research has suggested that depression can influence caregiver stress (Waylen & Stewart-Brown, 2010). As a result, caregiver stress was added as a mediating variable between caregiver depression and externalizing behaviors.

Previous analysis (Figure 11) in the current study demonstrated that a relationship between poverty and caregiver stress was not present in this sample. As a result, a path from poverty to caregiver stress was not added into the final model. In addition, in this sample the relationship between poverty and externalizing behaviors was fully mediated by caregiver depression (Figure 10), and as a result was not added into the final model.

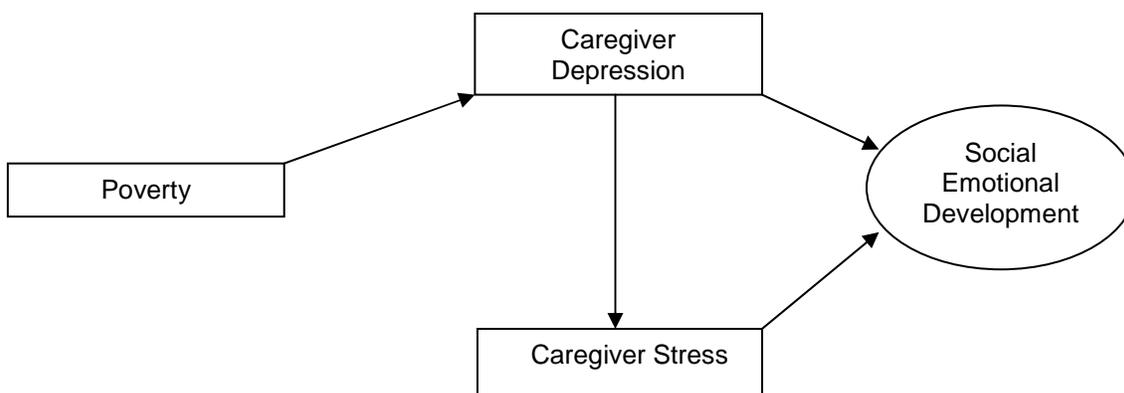


Figure 12. Revised Conceptual Model

In this model, latent variables (i.e., slope and intercept) for externalizing behaviors were regressed on the latent variables for caregiver stress (e.g., slope and intercept), the latent variables for caregiver stress were regressed on the latent variables (e.g., slope and intercept) for caregiver depression, and the latent variables for caregiver depression were regressed on poverty (see Figure 13). This model returned acceptable fit indices with the $\chi^2_{(67)} = 280.05$ versus a baseline $\chi^2_{(78)} = 1221.65$, RMSEA = .055; SRMR = .058. The $\chi^2_{(67)}$ of 280.05 versus a baseline $\chi^2_{(78)}$ of 1221.65 suggests that the tested model is much closer to fitting the data than a model that includes paths connect all variables to each other (Hooper et al., 2008). The RMSEA was in the good fit range and the SRMR was in the acceptable fit range, leading to the conclusion that the model fit was acceptable (Hooper et al.). Finally, externalizing behaviors scores at the grade 5 measurement point were correlated with caregiver stress scores at the grade 5 measurement points as a result of medication indices suggesting this patch would create a better fitting model. Correlating grade 5 externalizing behavior scores and grade 5 caregiver stress scores made good theoretical sense because, these measurement were taken and

the same time points and have been demonstrated to be related.

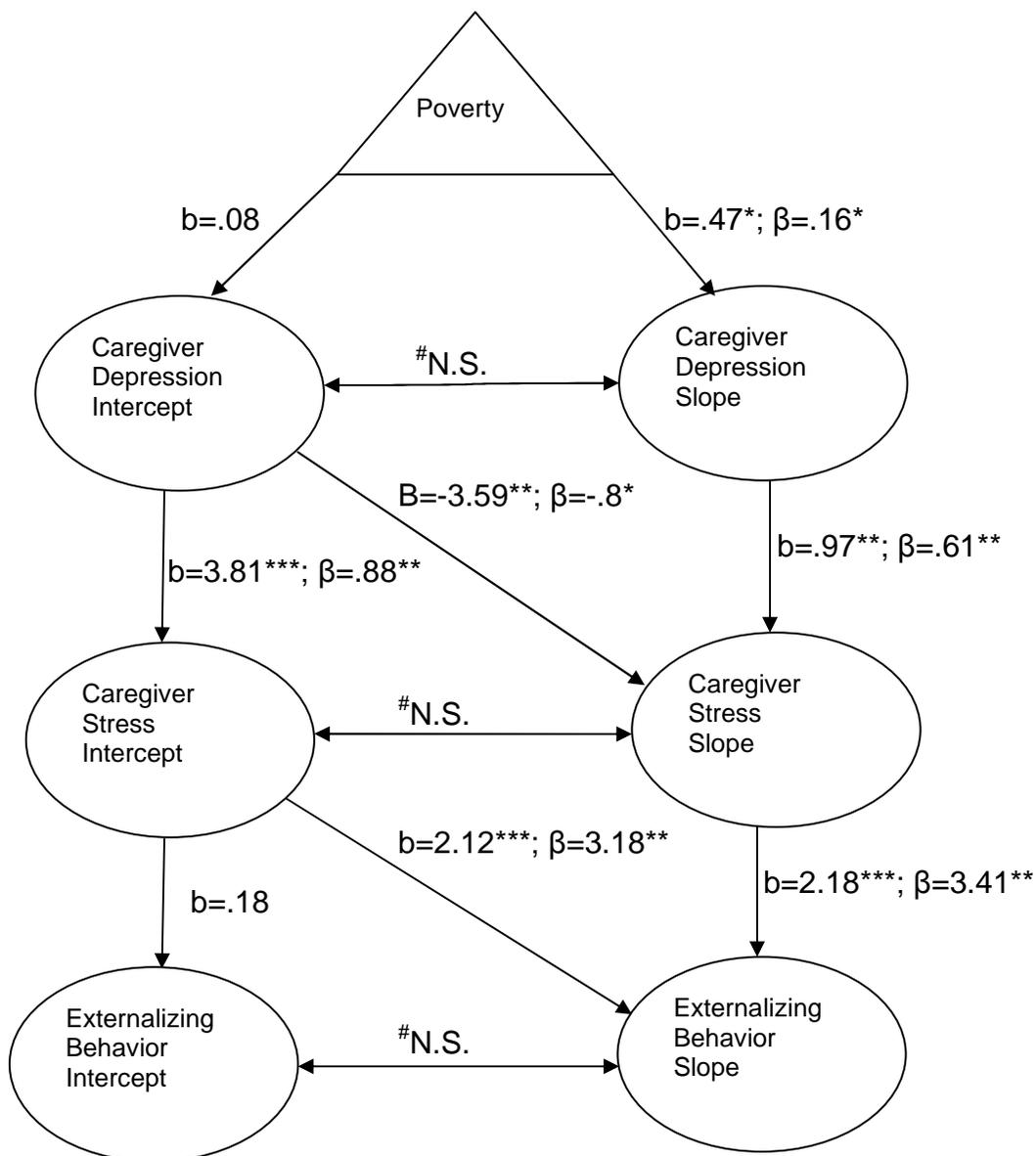


Figure 13. Full Mediating Model of Poverty, Caregiver Depression, and Caregiver Stress on Externalizing Behaviors

$\chi^2_{(67)} = 280.05$

Baseline $\chi^2_{(78)} = 1221.63$

RMSEA = .055

SRMR = .058

* $p < .05$; ** $p < .01$; *** $p < .001$;

#N.S. = non-significant

The analysis identified a significant relationship between the initial levels of parental stress and caregiver depression ($b = 3.81$; $p < .001$), suggesting that a one unit increase of initial level CES-D scores (caregiver depression) predicted a 3.81 point increase in initial level of parental stress scores (PCDI-SF). A significant relationship between the initial level of maternal depression scores and slope of parental stress was identified ($M = -3.59$; $p < .01$), suggesting that a one unit increase of initial CES-D scores predicted a 3.59 unit decrease in the slope of caregiver stress scores. This finding, taken in context with the significant relationship between initial level scores of caregiver stress and depression, suggests that caregivers who are highly depressed are likely to report high levels of stress in parenting their children, however the stress associated with those initial levels of depression is likely to subside over time. Finally, a significant relationship between the slope of caregiver depression and the slope of caregiver stress ($M = .97$; $p < .01$) was observed, suggesting that a one unit increase in the slope of caregiver depression scores over time predicts a .97 unit increase in caregiver stress scores overtime.

A significant relationship was identified between the initial level of caregiver stress scores and the slope of externalizing behaviors scores ($M = 2.12$; $p < .001$), implying that a one unit increase in the initial level scores of caregiver stress predicted a 2.12 unit increase in the slope of externalizing behavior scores overtime. In addition, a significant relationship was identified between the slope of caregiver stress scores and the slope of externalizing behavior scores ($M = 2.18$; $p < .001$), suggesting that a one unit increase in the slope of caregiver stress predicted a 2.18

unit increase in the slope of externalizing behavior scores. Previously, a significant relationship was identified between the slope of caregiver depression and the slope of externalizing behaviors ($b = 1.14$; $p < .05$; Figure 10); when caregiver stress was added as a mediator to this relationship, the relationship between caregiver depression and externalizing behaviors was no longer significant (initial level of caregiver depression and initial level of externalizing behaviors, $p = .51$; initial level of caregiver depression and slope of externalizing behaviors, $p = .82$; slope of caregiver depression and slope of externalizing behaviors, $p = .64$; not illustrated in Figure 13). These findings suggest that caregiver stress is fully mediating the relationship between caregiver depression and externalizing behaviors. More plainly put, caregiver depression is significantly related to caregiver stress, where caregiver depression increases so does caregivers' stress. In turn, as caregivers stress increases so do externalizing behaviors. Previous analyses found that maternal depression and externalizing behaviors were significantly related, it is now evident that the relationship between caregiver depression and externalizing behaviors are related through a third intervening variable (i.e., caregiver stress).

As a result of earlier analyses (Figure 10) suggesting that poverty was significantly related to caregiver depression, we added poverty as a covariate of maternal depression. A significant relationship between poverty and the slope of maternal depression was identified in this model ($M = .47$; $p < .05$); suggesting that a one-unit increase in poverty predicts a .47 unit increase in the slope of caregiver depression scores. As a result of previous analyses demonstrating that no significant relationship between caregiver stress and poverty was evident, and caregiver

depression mediated the effect of poverty on externalizing behaviors, paths between poverty and the slopes and intercepts of caregiver stress and externalizing behaviors were not specified. More plainly put, because previous analyses suggested that no relationship existed between poverty and caregiver stress, and the relationship between poverty and externalizing behaviors was no longer significant (as a result of the mediating properties of caregiver depression), it was assumed that no relationship between these variables existed in the final model. The final model demonstrates a relationship where poverty is related to caregiver depression, and caregiver stress is mediating the relationships between caregiver depression and externalizing behaviors.

CHAPTER 5: DISCUSSION & SUMMARY

Trajectories of Measured Constructs

Latent growth curve trajectories were constructed for each of the measured constructs in this study (i.e., social emotional development, caregiver depression, caregiver stress) as a preliminary step towards analyzing the research questions. Previous research has reported the trend of these constructs over time, but no research was identified that has reported trajectories for the EHRSE population. These trajectories will augment the existing literature on how these constructs manifest in caregivers and children in similar situations.

Externalizing behaviors. It is hypothesized that the typical decrease of externalizing behaviors seen in children is due, in-part, to the development of communication skills and increased interaction with peers where appropriate behaviors are learned (Bongers, Koot, Vander Ende, & Verhulst, 2003; Cillessen & Belmore, 2004; Tremblay, 2000). The findings of this study support the prevailing theories as group marginal means for externalizing behaviors decreased slowly between 2 years to 3 years, and decreased at a steeper rate from 3 years to pre-kindergarten, then displayed the largest drop from pre-kindergarten to 5th grade. The results suggest the externalizing behaviors for children in this sample decreased as they aged, which coincides with the development of communication skills in the general population (2 years to pre-kindergarten) and children's interactions with peers becoming more skilled (pre-kindergarten to 5th grade).

Caregiver depressive symptoms. The depressive symptoms for the entire sample of the current study followed a downward trajectory in line with Ashmen and

colleagues' (2009) findings in their overall sample. At no point did the group mean scores for the current study of EHSRE participants approach a score of 15 (scores above this figure represent high levels of depressive symptoms for the CES-D short form; Administration on Children, Youth, and Families, 2002). This suggests that the sample did not have exceptionally high levels of depression. In addition, the highest level of caregiver depression for the group was observed at about the time children were one year of age, which is also congruent with the findings of Ashmen and colleagues.

Comparing the sub-sample of participants used for the current study to the overall EHSRE population suggest that the this study sample had a slightly higher level of CES-D scores at the time their children were 3 years of age than the EHSRE study sample as a whole (Administration on Children, Youth, and Families, 2002). The difference between the current sample and the overall EHSRE study population is comparatively small (less than 1 point) and far below what is considered to be a "high" rate of depressive symptoms (Administration on Children, Youth, and Families). Though the group means did not reach a score of 15, the finding that caregiver depressive symptoms were highest early in the child's development suggests that within the first few years of a child's life they are experiencing the greatest occurrence of caregiver depression. It is important that early identification and intervention for caregivers be carried out if interventionists are to spare children the potential negative effects of experiencing parental depression early in their development (e.g., Leve, Kim, & Pear, 2005; Shaw, Lacourse, & Nagin, 2005). It stands to reason that some caregivers' depressive symptoms did not follow the

same downward trajectory as was witnessed in the group as a whole. It is vital that caregivers with greater depressive symptoms be identified early, and that help is provided in an effort to decrease depressive symptoms early because these depressive symptoms have been linked to a greater likelihood of externalizing behaviors in middle to late childhood (Shaw et al., 2005) and an increase in externalizing and internalizing behaviors through adolescence (Leve, Kim, Pear, 2005).

Caregiver stress. The downward trend observed for parenting stress in the sample for this study was similar to the trend found in Williford and colleagues' (2007) study, in which the PSI-SF was utilized with parents whose children were measured from 2 years old to 5 years old. These findings suggest that during children's first 2 to 3 years of life, parents show the highest level of stress in their relationship with their children (also when externalizing behaviors for children are highest). It could be that the stress from raising a child increases the likelihood of children exhibiting externalizing behaviors, or externalizing behaviors increase the likelihood of caregiver stress. It is also possible that there is a bi-directional influence between caregiver stress and child externalizing behaviors and they are influencing each other.

Interestingly, the largest decrease in caregiver stress was observed between the prekindergarten measurement and the 5th grade measurement. Unfortunately, Williford and colleagues only reported scores for the complete PSI-SF and not the individual subscales (PCDI-SF). As a result, a comparison of base PCDI-SF scores between the current study and Williford and colleagues study cannot be made. Crnic

and colleagues (2005) identified in their sample of 125 typically developing children that maternal stress changed very little from ages 3-5 (maternal stress was measured utilizing a composite variable of several measures). Though an overall downward trend for caregiver stress was identified in the current study, the largest decrease was seen from pre-kindergarten through 5th grade, which appears to be congruent with Crnic and colleagues findings. It is interesting that the largest decrease in stress happens around the time that children begin attending full day school. It is possible that caregivers are less "stressed" after their children are not under their supervision for a majority of the day.

The trajectories of caregiver stress coincide with the trajectories of caregiver depression and externalizing behaviors demonstrating that (at the least) all three are following a similar downward trend as the child ages. The downward trend found in caregiver stress, depression, and child externalizing behaviors suggests that there may be relationships between these measured variables. It is possible that an increase or decrease in one area (e.g., increase in caregiver depression) inevitable leads to a coinciding change in another area (e.g., increase in caregiver stress). These potential relationships will be discussed later in this paper.

Externalizing Behaviors and Gender

A small difference between child genders in initial levels and change of externalizing behaviors was observed in this study. Previous research has demonstrated that boys traditionally exhibit a greater occurrence of externalizing behaviors early (2-3 years old) in their development compared to girls (Bongers, Koot, Vander Ende, & Verhulst, 2004; Gilliom & Shaw, 2004). However, in the

current study girls showed a larger occurrence of initial levels of externalizing behaviors (e.g., .45 points higher than boys at 2 years). Prinstein and La Greca (2004) identified an increase in the prevalence of externalizing behaviors in girls in recent years. It may be the case that in this sample the higher rate of externalizing behaviors for girls (compared to boys) is related to the recent increase in externalizing behaviors observed in girls cited by Prinstein and La Greca. Another possible reason for the similarities in boys and girls externalizing behaviors score could be a link between maternal depression and daughters externalizing behaviors scores. Stacks and Goff (2006) identified in their sample of Early Head Start children that a greater occurrence of maternal depression scores also predicted a greater likelihood of externalizing behaviors for girls but not boys. It could be possible that the exaggerated rate of externalizing behaviors (for girls) identified in the current study is a result of a heightened sensitivity to maternal depression. This hypothesis is logical when considered with the knowledge that mothers living in impoverished settings are more likely to be depressed (Chazan-Cohen et al., 2007).

The decrease in externalizing behaviors observed in the present study for both boys and girls is consistent with previous research (Bongers, Koot Vender Ende, & Verhulst, 2004; Prinstein & La Greca, 2004). In addition, the convergence of externalizing behaviors scores for boys and girls at 5th grade (nearly the same group mean score at 5th grade) is consistent with previous research (Bongers, Koot Vender Ende, & Verhulst, 2004; Prinstein & La Greca, 2004). As a result, the novel finding of this analysis is the fact that girls and boys were so close initially (girls' group mean was slightly higher than boys). This is contrary to body of literature that suggests

boys are more likely than girls to exhibit externalizing behaviors early in their development (Gilliom & Shaw, 2004).

As stated above, it is possible that this similarity could be due to the fact that greater maternal depression scores are associated with a greater likelihood of externalizing behaviors in girls (Stacks and Goff, 2006). Given that highest rates of depression coincide with the highest rates of externalizing behaviors in the current study, it appears there is a possible link. It is also possible that other caregiver-child interaction variables could be influencing similarities in externalizing behaviors between boys and girls in this sample. Specifically, caregiver punishment style has been reported as influencing the rate of externalizing behaviors in girls but not boys (Lochman & Wayland, 1994). Further investigation of this finding is beyond the scope of this paper, however, future research should investigate parental process variables (e.g., punishment style, parent-child attachment) which have been reported to be related to girls' early externalizing behaviors (Lochman & Wayland, 1994).

Poverty and Externalizing Behaviors

Results suggest that as time spent in poverty increased, so did caregiver reports of child externalizing behaviors. This finding is congruent with previous research that demonstrated a co-occurrence of time in poverty and increased likelihood of externalizing behaviors in children (Brooks-Gunn & Duncan, 1997; Duncan, Brooks-Gunn & Klebanov, 1994; Mistry et al., 2002; Moore, Gleib, Driscoll, Zaslow, & Redd, 2002). It is probable that it is not solely poverty that is leading to a greater level in externalizing behaviors. It is most likely that the influence of poverty (lack of resources, stress placed on family) is influencing the caregiver child

relationship, and the parent child relationship is influencing the likelihood of children exhibiting externalizing behaviors.

The use of latent growth curve in this analysis to investigate the relationship between time spent in poverty and the existence of externalizing behaviors demonstrates that the length of time in poverty is related to a greater occurrence of externalizing behaviors. Where previous research has demonstrated that the more time a child spends in poverty, the more likely they are to exhibit externalizing behaviors at one specific measurement point (e.g., Mistry et al., 2002), this analysis suggests that time spent in poverty predicts an increase in the trajectory of externalizing behaviors over time. This means that the longer a child spends in poverty the more likely they are to also exhibit externalizing behaviors as they get older.

The finding that length of time in poverty was not related to the initial level of externalizing behaviors does appear counter to previous research that suggested that children who live in poverty early and for a short time are more likely to exhibit externalizing behaviors than children who live in poverty over extended periods of time (Brooks-Gunn & Duncan, 1997; McLeod & Shanahan, 1993). In McLeod and Shanahan's study, a cross sectional sample of children 4-8 years old was utilized to judge the relationship between poverty and externalizing behaviors. Children included in the current study were at least 2 years younger than the youngest children in McLeod and Shanahan's study (the current study's children were measured at 2 years old). It may be the case that for the children included in the current study, poverty and externalizing behaviors were not related at 2 years of

age. Put in another way, the relationship between poverty and externalizing behaviors has not manifested at the age of 2. It is possible that children need to live in poverty for an extended period of time before a relationship between poverty and externalizing behaviors is evident.

It should also be noted that previous research has found that an increase in internalizing behaviors was seen when children in their sample lived in poverty over extended periods of time (Brooks-Gunn & Duncan, 1997; McLeod & Shanahan, 1993). Internalizing behaviors were not added into the model for this study, but it may be the case that externalizing behaviors mediate the relationship between poverty and internalizing behavior. Internalizing behaviors were collected for the 5th grade data point, and future research should investigate the possibility that initial level of externalizing behaviors or trajectories of externalizing behaviors predicted internalizing behaviors at 5th grade.

Caregiver Stress and Externalizing Behaviors

Previous research has demonstrated a relationship between caregiver stress and child externalizing behaviors in which an increase in caregiver stress is associated with an increase in externalizing behaviors (Barry, Dunlap, Cotton, Lockman, & Wells, 2005; Qi & Kaiser, 2003). The findings in this study are unique in that they demonstrate that as caregiver stress scores increase, one can expect to see an increase in externalizing behavior scores in children over the course of time. Related to this, as caregiver depression scores increase, one can expect to see an increase in caregiver stress scores over time. Previously, the relationship between caregiver stress and externalizing behaviors had been investigated utilizing

measures that only look at the existence of a behavior at one time point. At best, a single latent growth curve was utilized with predictors that measured behaviors at a single time point. As a result of combining multiple latent growth curves with SEM, the current study was able to look at the relationship of change overtime (slopes) between two measured behaviors. This type of analysis is important because it identifies that change in one area of a family or child's development (caregiver stress) can have a prolonged, lasting effect on the change in another area of a family or child's development.

The findings suggest that the longer children are exposed to caregiver stress the more likely they are to exhibit externalizing behaviors. This conclusion is supported by the finding that initial levels of caregiver stress were not significantly related to initial levels of externalizing behaviors, but the relationship between the variables showed an effect as the children grew older. Thus it appears that parenting stress has an impact on children's behavior that extends over years. A minimal amount of research exists to suggest the age or time point at which the relationship between caregiver stress and externalizing behaviors becomes evident. Kazdin and Whitley (2003) demonstrated that interventions to decrease parental stress (among other variables) for parents of children that were exhibiting clinical externalizing behaviors (as young as six years old) were effective in decreasing externalizing behaviors. However, these findings only suggest that caregiver stress is related to externalizing behaviors as early as 6 years old (Kazdin & Whitley, 2003). Kazdin and Whitley's findings do not suggest how early or what length of time is necessary for caregiver stress to influence externalizing behaviors.

A relationship between caregiver stress and poverty was not found in this sample. This finding is counter to previous research that a relationship between parenting stress and living near or below the poverty level exist (Copeland & Harbaugh, 2005; Ricciuti, 2004). As the PCDI-SF is a measure of caregiver stress describing the interaction between the parent and child's relations, it is possible that poverty contributes little to changes in stress in the parent-child relationship. Many of the families in this study have experienced poverty for a large portion of their lives and it may be the case that these caregiver-child interactions are less susceptible to stress that is related to living in poverty for extended periods of time.

Poverty, Maternal Depression, and Externalizing Behaviors

The mediating effect (the influence of poverty on externalizing behaviors is the result of the relationship between poverty and caregiver depression and caregiver depression's relationship to externalizing behaviors) of caregiver depression on poverty found in this study is similar to what has been reported in previous literature (Carlson & Corcoran, 2001). In addition, previous research using the EHSRE dataset found a link between poverty and CES-D scores and CES-D scores and CBCL scores (Malik et al., 2007). In Malik and colleagues' study, an SEM analysis utilizing cross-sectional data revealed that maternal depression was linked to child aggression for children aged 12 to 44 months. In a second model, Malik and colleagues identified that poverty was related to maternal depression. However, a mediating connection of caregiver depression on the relationship between poverty and externalizing behaviors was not investigated in the Malik and colleagues' study. Also, Malik and colleagues looked at a cross-sectional sample,

which does not allow researchers to generalize about a child's and family's course of development. One of the contributions of the current study to the prevailing body of literature on social emotional development is that it demonstrates that the relationship between poverty and externalizing behaviors previously observed, is actually mediated by caregiver stress. A relationship between poverty and caregiver stress exists where the longer a caregiver spends in poverty, the more likely they are to experience greater depressive symptoms. In turn, the greater amount of depressive symptoms a caregiver experiences, the more likely their child is to exhibit externalizing behaviors.

Findings from the current study identified the longer children lived in poverty, the more likely they were to exhibit more externalizing behaviors over the course of the measurement periods. This analysis demonstrates that a relationship occurs in time spent in poverty is related to more caregiver depressive symptoms over the course of the research period. In turn, the more caregiver depressive symptoms that are exhibited over the course of the study, the more likely children are to exhibit externalizing behaviors over time. As a result, it is not poverty that is directly related to externalizing behaviors, but it appears that the relationship between poverty and externalizing behaviors is affected by caregiver depression. These findings demonstrate that the link between poverty and externalizing behaviors previously identified in the literature (Mistry et al., 2002; Moore et al., 2002) may be a link between poverty and caregiver depression that then influences the existence and longevity of externalizing behaviors. As a result, it is important that interventionists and researchers begin to conceptualize interventions and studies that look at

poverty's influence on family level variables and the best manner in which to improve the quality of life for the whole family.

Full Conceptual Model

The revised conceptual model tested in this study (Figure 12), identified a path by which externalizing behaviors were related to caregiver depression through a relationship between caregiver depression and caregiver stress, and poverty was related to caregiver depression. Previous research had identified that the individual relationships (e.g., poverty and caregiver depression, caregiver depression and caregiver stress) identified in the final model for this study were present in various populations (e.g., Barry, Dunlap, Cotton, Lockman, & Wells, 2005; Carlson & Corcoran, 2001; Mistry et al., 2002). However, the current findings augment the existing literature in two major ways: (1) the manner in which maternal depression is related to externalizing behaviors through caregiver stress has not been previously cited in the research literature; and (2) the use of latent growth curves, which demonstrates that over the course of a child's and family's development, change in one variable is related to change in another variable, to demonstrate the relationships between poverty, caregiver depression, caregiver stress, and child externalizing behaviors.

The finding that initial level of caregiver depression and caregiver stress were related to each other suggests that caregivers who show higher levels of depression when their child is about a year old are also likely to exhibit higher levels of caregiver stress. This finding is logical as previous research has suggested that caregiver depression and caregiver stress often coincide with each other (Williford, Calkins, &

Keane, 2007). Interestingly, a high level of initial caregiver depression was related to a large decrease in caregiver stress overtime. This finding suggests that the effect of high initial caregiver depression on initial caregiver stress scores were not sustained across the measurement points. A greater occurrence of initial caregiver depressive symptoms was associated with a greater level of initial caregiver stress. However, over time caregiver stress scores tended to decrease, suggesting that initial depression scores were predictive of initial caregiver stress scores, but across the participants a decrease in both depression and stress occurred.

The finding that an increase in the slope of caregiver depression scores predicted an increase in the slope of caregiver stress scores implies that caregiver stress and depression are co-varying over time. This means that, on average, as caregiver depression increased a subsequent increase in caregiver stress was observed. The implications of this finding are that the longer caregivers spend with high levels of depressive symptoms the more likely they are to experience high levels of stress. As a result, it is important to identify and assist caregivers who are exhibiting depressive symptoms to curb the negative effects of the depressive symptoms and reduce any caregiver stress is that may be contributing to caregiver depression.

The relationship between caregiver depression and caregiver stress is even more important when one takes into account that a significant relationship between caregiver stress and child externalizing behaviors was observed. In this relationship, it was found that both the initial level of caregiver stress and change over time of caregiver stress predicted an increase in the slope (change overtime) of

externalizing behaviors. This means that a high level of caregiver stress when the child was around a year old was related to an increase of the trajectory of the child's externalizing behaviors. In addition, the finding that the trajectory of caregiver stress was related to the trajectory of child externalizing behaviors implies that the longer a caregiver experiences stress related to their relationship with her child, the more likely the child is to experience externalizing behaviors. This means that it is important to help parents who are experiencing stress early before their child experiences increasing externalizing behaviors.

Implications

These findings suggest a specific path through which poverty influences externalizing behaviors. In the model for the current study, poverty does not influence externalizing behaviors directly, but influences caregiver mental state, which appears to influence externalizing behaviors. The implications of these findings are far reaching for early intervention with children who are exhibiting externalizing behaviors. For specific interventions, these findings identify multiple variables that child and family level interventions could take place. At any point where one concept is linked to another through a third variable (mediation), it can be theorized that improving functioning in that area (e.g., decreasing caregiver depressive symptoms) will likely have positive effects on the externalizing behaviors for the child down the road. For example, effective interventions with a mother living in poverty who is exhibiting depressive symptoms and a child who is exhibiting externalizing behaviors will likely decrease the mother's level of caregiver stress. As a result, one could expect this mother's decreased stress to increase her positive

interactions with her child, which would lead to the child exhibiting fewer externalizing behaviors (Williford, Calkins, & Keane, 2007).

These findings suggest that the earlier an intervention is implemented with a caregiver or child the more likely an intervention is to be successful. Previous research has demonstrated that the earlier children with social emotional development issues can be identified, and the earlier children with social emotional problems can receive services, the greater the likelihood of success for these services (Perry, Dunne, McFadden, & Campbell, 2008; Shonkoff & Phillips, 2000). In some of the analyzed relationships, initial levels of one setting or behaviors (e.g., poverty, caregiver stress) were not related to initial levels of another behavior (e.g., caregiver depression, externalizing behaviors), suggesting that it is prolonged exposure to any of these conditions or situations that is related to the negative outcome. These findings call for a move toward earlier identification and intervention of family and child issues. Specifically, early identification of caregiver stress and depression appears to be an area where mental health counseling and positive parenting practices training could be favorable in decreasing externalizing behaviors. Where poverty may be ubiquitous in a community, caregiver depression and stress are specific states that an interventionist can identify on an individual family basis and be used to design treatments.

The overall findings of this study suggest that interventions for children who are exhibiting externalizing behaviors in early and middle childhood should not be conducted in a vacuum. Specifically, interventions focused on decreasing externalizing behaviors should look at the family and community context in which

children and their externalizing behaviors exist. Interventions that are focused on the whole family system are not an entirely new idea (e.g., Baily, Bruder, Carta Defosset, Greenwood, Kahn, et al., 2006). However, research that suggests a specific path through which interventions can occur allows interventionists a more concrete platform through which they can argue for whole family focused intervention. Utilizing multiple areas of intervention to decrease externalizing behaviors in early childhood also falls in line with suggested early childhood practices that state; 1) a system of support should be in places for families to utilize; 2) families should be able to obtain community services and participate in community activities; and 3) families should be able to support their child development and learning (Baily et al., 2006). Finally, some research has already demonstrated that family-centered interventions can decrease parenting stress related to the parent-child relationship (Keen, Rodger, Couzens, & Muspratt, 2008). These findings are encouraging and suggest continued effort toward family centered interventions is meaningful and advantageous to families.

Future Research

Several areas of future research have become evident from the current research study. Analyses utilizing internalizing behaviors at the 5th grade measurement point should be conducted. Specifically, analyses looking at predictors of internalizing behaviors (e.g., maternal depression, poverty, gender) at the 5th grade measurement point should be conducted. The dataset utilized for the current study would be conducive to further investigating these relationships (Gilliom & Shaw, 2004; Kiesner, 2002; Keisner, Cadinu, Poulin, & Bucci, 2002). Finally, utilizing

internalizing behaviors measured at 5th grade as an outcome measure for the externalizing behaviors latent growth curve utilized in the current study would add insight into the increased likelihood of children exhibiting internalizing behaviors if they have exhibited externalizing behaviors early in their development (Gilliom & Shaw, 2004).

Future studies should further investigate the lack of differences between genders in externalizing behaviors observed for children in this study. Previous research suggests that various parent-child variables (i.e., punishment, attachment) are related to externalizing behaviors in girls (Lochman & Wayland, 1994). It may be the case with this data set that the girls in this study were exposed to various parent-child level variables that led them to have externalizing behaviors that were greater than their male counterparts early in their development. However, explanations for reasons why the present study's findings deviate from previous research are purely speculative and additional research is needed to explain these findings.

The finding that caregiver stress over time was related to externalizing behaviors over time was a novel finding in and of itself. However, further investigation on the relationship between caregiver stress and externalizing behaviors should be conducted. Specifically, a bi-directional influence of externalizing behaviors on caregiver stress may be present. In addition, various-parent child interaction variables (i.e., punishment, warmth) may be present that mediate the relationship between caregiver stress and externalizing behaviors. In addition to adding parent-child interaction variables, the addition of ethnicity as a moderator may provide additional information on how caregiver stress and

externalizing behaviors relate to one another. It is important to fully understand that manner in which caregiver stress and externalizing behaviors relate to each other to conceptualize interventions that benefit the whole family.

The findings of the current analysis suggest that interventions for the complete family may be well suited when addressing children's social emotional development issues. Suggesting that a child's environment and home life be taken into account when creating interventions is not a new concept (see Baily et al., 2006 for an in-depth description). However, the findings from this study highlight specific aspects of the child's family environment that may return good outcomes (for social emotional development and caregiver mental health) if interventions are implemented with them. As a result, research that focuses on interventions that address caregiver stress and caregiver depression should be conducted. In addition, the prevalence and change of externalizing behaviors as a result of interventions on caregiver stress and depression should be measured.

Finally, the selection criteria for the current study (CBCL scores for all measurement points) was fairly restrictive. Participants were selected in such a fashion to ensure that full coverage was achieved utilizing the FIML in Mplus (Muthen & Muthen, 2010). However, less restrictive inclusion rules could be utilized (e.g., participants with 2 missing CBCL measurement) to investigate if the participants not included in the study alter the findings.

Limitations

Though the findings in this study are useful in expanding that existing literature on the effects of poverty on social emotional development, there are

limitations to this study. The participants included in this study were those who had a complete CBCL for all measurement points (2 year, 3 year, pre-kindergarten, and 5th grade). Though initial analysis revealed that the groups did not differ on several demographic measures (e.g. caregiver education at 5th grade, child ethnicity), it cannot be said with certainty that the participants in this study did not differ from the participants not included. EHRSE families who were not included in the current study did not have complete CBCL data, and as a result, may differ from families who were included in the current study based on their willingness to participate in the larger EHRSE study. However, by all measures used, no differences were observed between the groups on the demographic indicators. As a result, it was assumed the sample selected (from the EHRSE dataset) was a well fitting sample to answer the research questions.

The sample selected for this study is a unique sample drawn for a specific sub-population (EHRSE participants). As a result, this sample may not be representative of all families living in poverty across the United States. The sample may deviate from U.S. residents living in poverty on demographic variables (i.e., ethnicity) or the variables of interest (i.e., externalizing behaviors, caregiver depressive symptoms) used in this study. As a result, care should be taken when generalizing findings of this study to the greater U.S. population.

The measures utilized for this study were reported by the child's caregiver and not by trained independent assessors. Though the CBCL, CES-D, and PSI-SF all show good reliability and validity as measures, a parent report measure may be influenced by some subjectivity. In addition, norms for the CBCL, CES-D, and PSI-

SF were all conducted on nationally representative samples. The sample used for this study was not nationally representative. As a result, care should be taken when comparing the findings for children in this study to other studies using these measures.

The poverty variable for this study was constructed through the use of caregiver reports of monthly income and number of household occupants. Participant income reporting can often be incorrect because low-income families' occupations (and resulting income) may change frequently and make their reports inaccurate. In addition, social desirability may play a role in reporting higher incomes than participants actually receive. Participants for this study had to be eligible for Head Start services, which means at the time of inclusion in the study almost all families were at or below 125% of the poverty line (Administration for Children, Youth, and Families, 2002). As a result, most participants in the study did live at least some time in poverty, but a more objective measure of income (e.g., pay stubs, income tax forms) would have been a more ideal way to assess poverty.

Summary

Previous research has identified links among poverty, maternal depression, and externalizing behaviors (Barry, Dunlap, Cotton, Lockman, & Wells, 2005; Carlson & Corcoran, 2001; Mistry et al., 2002). In addition, links among caregiver depression, caregiver stress, and externalizing behaviors have previously been investigated in the literature (Copeland & Harbaugh, 2005; Ricciuti, 2004; Williford, Calkins, & Keane, 2007). However, mediating links between these variables had not

been investigated concurrently. Specifically, a model in which a path from time spent in poverty to externalizing behaviors through caregiver depression and caregiver stress had not been tested. In addition, latent growth curves and SEM had not been used to gauge each variables relationship to the other over time. The resulting findings identified a relationship where poverty's effect on externalizing behaviors was mediated by caregiver depression and caregiver depressions effect on externalizing behaviors was mediated by caregiver stress.

The findings of this study highlight multiple areas for future research. Research investigating the connection between early externalizing behaviors and later internalizing behaviors will be beneficial in determining the relationship between these two aberrant behaviors. In addition, utilizing the family level variables from the current study as predictors of internalizing behaviors at 5th grade will likely return significant results and shed light on what influences internalizing behaviors in children. Further research into the slightly higher rate of girls externalizing behaviors around ages 2-3 years old (for this sample) should be conducted. Caregiver child interaction variables that may mediate the relationship between caregiver stress and externalizing behaviors should be identified to increase the possibility of success of interventions for externalizing behaviors. Finally, research testing the efficacy of interventions that focus on decreasing caregiver depression and stress, and how well they decrease externalizing behaviors should be conducted.

The implications of these findings suggest that interventions to curb externalizing behaviors should focus both on the child and on the family as a whole. Interventions that can remove the influence of either of the mediating variables

(caregiver depression and stress) could have significant influences over the mother-child relationship and to an extent, the child's externalizing behaviors. On a community level, it may be unrealistic to remove the influence of poverty, but interventions focused on caregiver depression and stress may buffer the effects of poverty on children's social emotional development.

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