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## THE RECIPROCAL RELATION BETWEEN MATERNAL DEPRESSIVE SYMPTOMATOLOGY AND ADOLESCENTS' AGGRESSION: THE ROLE OF PARENTING PRACTICES AND FAMILY FUNCTIONING

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“THE RECIPROCAL RELATION BETWEEN MATERNAL DEPRESSIVE  
SYMPTOMATOLOGY AND ADOLESCENTS’ AGGRESSION: THE ROLE OF  
PARENTING PRACTICES AND FAMILY FUNCTIONING”

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of  
Philosophy at Virginia Commonwealth University

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## **Abstract**

### **THE RECIPROCAL RELATION BETWEEN MATERNAL DEPRESSIVE SYMPTOMATOLOGY AND ADOLESCENTS' AGGRESSION: THE ROLE OF PARENTING PRACTICES AND FAMILY FUNCTIONING**

By Kelly Lauren Pugh, M.S.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2012

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Research on family influences on adolescents' aggression has revealed a relation between maternal depressive symptoms and adolescents' frequency of aggression. A recent cross-sectional study of these relations (Pugh & Farrell, 2011) indicated that maternal depressive symptoms had a significant relation with teachers', students', and mothers' reports of adolescents' aggression. This effect was mediated by parenting practices and family functioning.

The cross-sectional designs used in previous studies examining relations between maternal depressive symptoms and adolescents' aggression make it difficult to draw clear inferences regarding the causal nature of this association. The present study used longitudinal data across five waves of data from a large multi-site study to explore reciprocal relations

between maternal depressive symptoms and adolescents' aggression and the role of parenting practices and family functioning as a mediator of this relation.

Participants were 521 mother-adolescent dyads (64% Male; 69% African American) from 18 schools from four different sites throughout the United States representing a range of socioeconomic backgrounds. About 40% of the mothers met criteria for clinically elevated depressive symptoms. Data were collected across five waves from fall of the sixth grade to spring of the eighth grade. Maternal depressive symptoms were assessed using the Center for Epidemiologic Studies Depression scale and adolescents' aggression was assessed using adolescents' reports on the Problem Behavior Frequency Scales and mothers' and teachers' ratings on the Behavior Assessment System for Children.

Analyses revealed positive correlations between maternal depressive symptoms and adolescents' aggression within each time point ( $p < .01$ ). Autoregressive path models revealed the reciprocal nature of maternal depressive symptoms and mothers' report of aggression among female adolescents (significant paths at the majority of time points,  $p < .05$ ), but not among male adolescents. Hence, findings provide support for the reciprocal relation between maternal depressive symptoms and female adolescents' aggression. With few exceptions, support was not found for parenting and family variables mediating this relation.

## The Reciprocal Relation between Maternal Depressive Symptoms and Adolescents' Aggression: The Role of Parenting Practices and Family Functioning

Rates of aggression are alarmingly high among adolescents in the United States. In a national survey, 36% of high school students reported being in at least one physical fight in the past 12 months and 18% reported carrying a weapon in the past 30 days (Center for Disease Control [CDC], 2008). Another survey found that 30% of sixth through tenth grade students reported being the target of or perpetrator of bullying (Nansel et al., 2001). In addition, an estimated 1 in every 6 parents are physically assaulted by an adolescent child at some point, and researchers have estimated that 40 to 60% of children are physical aggressive towards their siblings (e.g., Goodwin & Roscoe, 1990; Paulson, Coombs, & Landsverk, 1990; Straus, Gelles & Steinmetz, 1980). The urgency of this matter has been further supported by research documenting the negative consequences of aggression in adolescence, such as substance dependence and sexual promiscuity (e.g., Bardone, et al., 1996).

Researchers have identified a variety of parenting and family factors that place adolescents at a higher risk for aggression. Among these factors, increasing attention has focused on the impact of maternal depressive symptoms on adolescents' aggressive behaviors. Maternal depression is often used by researchers to describe an elevation in depressive symptoms and not a clinical diagnosis of depression. Therefore, the present paper uses the term maternal depressive symptoms unless a study specifies having assessed for a clinical diagnosis of depression.

Depression affects nearly 20% of adults, with the highest rates occurring among women during their childbearing years and low-income women (e.g., Beeghly et al., 2003). Research has documented the effects of maternal depressive symptoms on externalizing behaviors, specifically aggression (e.g., Marmorstein & Iacono, 2004; Pilowsky et al., 2006), and the relation between

maternal depressive symptoms and youth aggression has been well-documented across all ages (e.g. Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan., 2001; Halligan, Murray, Martins, & Cooper, 2007; Josefsson & Sydsjo, 2007; Luoma et al., 2001). This relation has been found in both cross-sectional (e.g. Pilowsky et al., 2006) and longitudinal research (e.g. Josefsson & Sydsjo, 2007).

Researchers have proposed two explanations to account for the relation between maternal depressive symptoms and adolescents' aggression. First, it has been argued that parenting practices may be the mechanism through which maternal depressive symptoms influences adolescents' aggression (e.g., Barry, Dunlap, Lochman, & Wells, 2009; Gelfand & Teti, 1990). Maternal depressive symptoms have been linked to a number of maladaptive parenting practices, including being aggressive, unresponsive, and inconsistent (e.g., Frye & Garber, 2005; Gelfand & Teti, 1990; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Researchers have also found that parenting practices, including discipline, level of supervision and monitoring, and parental support, have been linked to aggression among youth (e.g., Amato & Fowler, 2002; Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Sheehan & Watson, 2008). Parents play an important role in an adolescent's behavior and mental health outcomes, and parent-child processes can influence behavioral outcomes of adolescents (e.g., Bronfenbrenner, 1979). Others have maintained that family functioning accounts for the relation between maternal depressive symptoms and adolescents' aggression (e.g., Timko, Cronkite, Berg, & Moos, 2002). Maternal depressive symptoms are associated with poor family functioning, including low levels of family cohesion and increased conflict between family members (e.g., Fendrich, Warner, & Weissman, 1990; Timko et al., 2002). Research has also found that family functioning, including marital violence, family cohesion, family structure, and communication patterns, is associated with

adolescents' aggression and externalizing behaviors (e.g., Gorman-Smith, Tolan, Henry, & Florsheim, 2000; McCloskey & Lichter, 2003).

The majority of studies examining the relation between maternal depressive symptoms and adolescents' aggression have focused on maternal depressive symptoms as a cause of adolescents' aggression (e.g., Pilowsky et al., 2006). Fewer studies have examined the possibility that adolescents' aggression influences maternal depressive symptoms or explored the possibility of a reciprocal relation between maternal depressive symptoms and adolescents' aggression. This limits the interpretation of previous research findings. For example, research findings have not clearly established the cause-effect relations between maternal depressive symptoms and adolescents' aggression or the developmental continuities or changes in the relation over time. Recent studies exploring the relation between maternal depressive symptoms and adolescents' aggression have found support for a reciprocal relation (Gross, Shaw, Burwell, & Nagin, 2009; Gross, Shaw, & Moilanen, 2008). Parenting practices and family functioning have been proposed as mechanisms through which maternal depressive symptoms and adolescents' aggression mutually influence one another. Parenting practices or family functioning can be influenced by maternal depressive symptoms (e.g., a depressed mother exhibits higher rates of inconsistent discipline practices or marital discord), which can lead to increases in aggressive behaviors (e.g., Deater-Deckard, Dodge, Bates, & Pettit, 1996). Adolescents' aggression may then, in turn, sustain maternal depressive symptoms by influencing family processes and causing additional distress (e.g., Bates, 1980; Cui, Donnellan, & Conger, 2007; Patterson, 1982).

The present study was designed to address several gaps in the literature about the relation between maternal depressive symptoms and adolescents' aggression. First, it builds on previous research by examining the relation between maternal depressive symptoms and adolescents'

aggression from a reciprocal framework. The present study also aimed to account for limitations in the generalizability of previous studies that have examined this relation (e.g., limited sample sizes, predominantly Caucasian populations, or only including boys in the sample) (e.g., Gross et al., 2008, 2009). A large, predominantly low to middle class, ethnic minority sample of both adolescent male and female students was examined in the present study. This sample included students from 37 schools from four different sites throughout the United States. This sample was particularly appropriate because a high prevalence of maternal depressive symptoms have been found among minorities and low income families (e.g., Hatcher, Rayens, Peden, & Hall, 2008; Lee, Anderson, Horowitz, & August, 2009). The present study also built on previous research by examining the unique contribution of factors that have been proposed to account for the impact of maternal depressive symptoms on adolescents' aggression, specifically parenting practices and family functioning. Because there is limited research on adolescents' aggression as a cause of maternal depressive symptoms, the present study also aimed to explore possible mechanisms that might mediate this relation based on current theory (e.g., Patterson, 1982).

To address potential biases associated with examining relations among variables from a single source, the present study included mothers' and adolescents' report of parenting and family practices, and mothers', teachers' and adolescents' ratings of adolescents' aggression. In contrast to previous studies that used fairly global measures of youth functioning that assessed internalizing and externalizing problems (e.g., Campbell, Morgan-Lopez, Cox, McLoyd, & National Institute of Child Health and Human Development Early Child Care Research Network, 2009), the present study examined specific aspects of externalizing behaviors (e.g. aggression) that may be driving the findings.

## Review of the Literature

**Aggression among Adolescents.** Aggression has been defined as a behavior that aims to cause harm to another individual or group of individuals verbally, physically, and/or interpersonally or damage to their property (Archer & Coyne, 2005; Brook, Rosenberg, Brook, Balka, & Meade, 2004). Aggression is a multifaceted behavior that includes several subtypes. It can be overt or indirect based on the method of harm and the intended goal (Crick & Grotpeter, 1995). Overt aggression involves direct harm to another individual and can include physical and verbal aggressive behaviors, such as punching or threatening (Coie & Dodge, 1998). In contrast, indirect aggression involves harm to another individual by damaging a social relationship and can include gossiping or spreading rumors (Crick & Grotpeter, 1995; Crick et al., 1999). In addition to these two forms of aggression, there are two functions of aggressive behavior, proactive and reactive (Crick & Dodge, 1996; Dodge, 1991; Dodge & Coie, 1987). Proactive aggressive behavior is unprovoked and used to gain dominance over others. It is goal-directed and deliberate. In contrast, reactive aggression occurs in response to a perceived provocation or threat and it is often accompanied by anger (Dodge & Coie, 1987; Dodge, 1991; Crick & Dodge, 1996).

Aggression is one of the key features of disruptive behavior disorders, including oppositional defiant disorder and conduct disorder (American Psychiatric Association (APA), 1994). Disruptive behavior disorders are marked by symptoms of aggression, noncompliance, defiance to authority figures, aversive interpersonal behavior, and angry tantrums. The main difference between oppositional defiant disorder and conduct disorder is that conduct disorder includes more severe symptoms and occurs later on the developmental continuum (Children and Adults with Attention-Deficit/Hyperactivity Disorder [CHADD], 2005). Two patterns of conduct

and antisocial problem behaviors have been highlighted in the literature, early-onset and adolescent-onset. An early-onset persistent pattern includes the development of behavior problems earlier in life, as early as three years old. This type of pattern is associated with more serious antisocial and conduct behavior problems during adolescence and is likely to develop into a stable pattern of criminality in adulthood. The adolescent-onset pattern begins during middle to late adolescence and behavior problems generally discontinue during young adulthood (Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996).

Adolescence is a particularly pertinent developmental time period to study aggression because aggressive behaviors peak among this age group (e.g., Pilowsky et al., 2006). A recent national survey found the following lifetime prevalence estimates for disruptive behavior disorders among young adults ages 18-25 years old: oppositional defiant disorder (10%), conduct disorder (11%), intermittent explosive disorder (8%), and any impulse control disorder (27%) (Kessler et al., 2005). Estimates of oppositional defiant disorder and conduct disorder among school-age children have been found to range from 5% to 25%. One study examining the rates of conduct and emotional problems across a 25-year period found that the number of adolescents with severe conduct problems more than doubled from 1974 to 1999 (Collishaw, Maughan, Goodman & Pickles, 2004).

Two surveys found that more than half of middle school adolescents reported having experienced violence perpetration and 43% of high school freshman reported hitting another student in the past 6 months (Kingery, McCoy-Simandle, & Clayton, 1997; Saner & Ellickson, 1996). Prevalence for more extreme forms of aggression is also quite high. A national survey found that an average of 15 adolescents and young adults, ages 10 to 24, are murdered every day and an additional 750,000 are treated in emergency care for injuries related to violence (Centers



for Disease Control and Prevention [CDC], 2006). Moreover, homicide is the third leading cause of death among children, ages 5 to 14 years old, and the second leading cause of death among youth, ages 15 to 24 years old (Kachur et al., 1996; Murphy, 2000). A worldwide study found that the United States has the highest incidence of violence among youth (Department of Health and Human Services [DHHS], 2001). These rates are even higher among minority youth. Homicide is the leading cause of death among African American adolescents and young adults and the second leading cause of death among Hispanic adolescents and young adults (CDC, 2006).

**Depressive Symptoms among Mothers.** Depression affects nearly 20% of adults and is one of the most pervasive and debilitating mental illnesses occurring in the United States (Kessler et al., 2005). Prevalence rates are two times higher among women, and an estimated one-third of women will suffer from depressive symptoms in their lifetime (Kendler & Prescott, 1999). Across the world, it is estimated that 73 million women suffer from a major depressive episode each year, and suicide is the seventh cause of death among women ages 20 to 59 years old (World Health Organization [WHO], 2009). The highest rates of depression among women are found among mothers in their childbearing years, with 13% of women experiencing depressive symptoms within one year of childbirth delivery (e.g., Beeghly et al., 2003; WHO, 2009). Among women who experience depression, over 80% will experience more than one depressive episode during their lifespan (Kessler, 2006).

According to the DSM-IV, major depressive disorder includes experiencing at least five of the following symptoms during a two-week period, with symptoms representing a change from normal functioning: depressed mood most of the day, almost everyday; loss of interest or pleasure in most activities most of the day, almost everyday; significant weight loss or gain;

appetite changes; sleep disturbances; psychomotor agitation or retardation; fatigue or loss of energy; feelings of worthlessness; difficulty concentrating; recurrent thoughts of death; suicidal ideation or attempt; and evident impairment (APA, 1994). Individuals who suffer from clinical or subthreshold levels of depressive symptoms (e.g. experiencing depressive symptoms in the absence of a disorder) can experience significant impairment in their well-being and functioning. In addition, individuals who experience depressive symptoms not severe enough to be diagnosed as depression report substantial social, occupational, and physical impairment (Naerde, Tambs, Mathiesen, Dalgard, & Samuelson, 2000; Task Force on the DSM-IV, 1994).

### **The Relation between Maternal Depressive Symptoms and Adolescents' Aggression.**

Adolescence is a particularly relevant time to study the relation between youth aggression and maternal depressive symptoms. Adolescence poses unique challenges to the parent-child relationship that can influence behavioral outcomes among adolescents and the psychological functioning of parents (e.g., Bronfenbrenner, 1979). Grotberg and her colleagues (2006) argued that a supportive parent-adolescent relationship plays an integral role in making adolescents resilient. This includes having a trusting and connected parent-adolescent relationship, as well as parents modeling effective nonviolent behaviors, being aware of an adolescent's extracurricular activities and peer group, and setting general expectations (e.g., responsibility, feeling empathy for others, resolving conflicts with family and friends, building friendships, and increasing autonomy) (Grotberg et al., 2006). Other characteristics of the parent-adolescent relationship can have detrimental effects on adolescents. For example, parent-adolescent conflict has been found to lead to behavioral problems among adolescents (Obsuth et al., 2006).

Adolescence has been argued to be a developmental period when parents can have their strongest influence on children because it is a period of transition (Bronfenbrenner, 1979; Jaffee

& Poulton, 2006). Adolescents experience various transitions, such as transitioning into a new school setting or a new peer group and biological changes associated with puberty. Adolescents are also dealing with new social and academic stressors, such as peer pressure and romantic relationships (e.g., Hale, Van der Valk, Akse, & Meeus, 2008). Adolescents and their families are also learning to cope with adolescents becoming more autonomous and individuating. These transitions and changes make it a particularly tumultuous and stressful time for adolescents and their families, and it can cause significant strain on the parent-child relationship (Bronfenbrenner, 1979). An adolescent of a depressed mother may be particularly vulnerable to exhibiting problem behaviors like aggression because a depressed mother may not be able to provide adequate support for an adolescent to cope with the transitions.

Adolescence also marks a period of time when adolescents may need to rely on their parents more strongly for social and emotional support, and parents can have a significant impact on an adolescent's emotional and social development (Cortell, 2009). Maternal depressive symptoms may serve as an additional stressor for an adolescent and exacerbate their maladaptive behaviors. Alternatively, maternal depressive symptoms could affect an adolescents' ability to develop an autonomous identity (Beardslee, 1986; Jaffee & Poulton, 2006; LaRoche, 1989). For example, parenting behaviors associated with maternal depressive symptoms, such as unresponsiveness and a lack of involvement and support, can make it difficult for an adolescent to develop their sense of self and feel confident in their ability to become autonomous (e.g., Frye & Garber, 2005; Gelfand & Teti, 1990; Lovejoy et al., 2000).

Aggressive behaviors among adolescents can also influence a parent's mental health and well-being. Adolescence marks a time period that can be particularly challenging and stressful for parents. Adolescents and parents spend less time together, experience a decrease in closeness

to one another, and experience more intense affect related to conflicts (Laursen, Coy, & Collins, 1998; Laursen & Williams, 1997). This, in turn, can lead to parents experiencing less satisfaction in the parent-child relationship and poorer psychological functioning (Duncan, Coatsworth, & Greenberg, 2009).

The link between maternal depressive symptoms and adolescents' aggression has been supported across several studies (e.g., Pilowsky et al., 2006). However, researchers have disagreed about the nature of this relation. For example, researchers have debated the direction of the effects in this relation, as well as whether the chronicity or severity of maternal depressive symptoms matters (e.g., Pilowsky et al., 2006). In one study, Campbell and her colleagues (2009) examined the relation between maternal depressive symptoms and adolescents' adjustment within a predominantly Caucasian sample of adolescents and their families ( $N = 1,357$ ). Families were recruited during hospital visits to mothers who had recently given childbirth and researchers followed children in the study from birth to age 15 years old. Assessments were conducted when the youth was 1 month, 6 months, 15 months, 24 months, 36 months, 54 months, first grade, third grade, fifth grade, and sixth grade. Maternal depressive symptoms were assessed using self-report of the Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977), and adolescents' adjustment was assessed during a laboratory visit at age 15 years using the self-report of the Children's Depression Inventory (CDI; short form, Kovacs, 1992), the Loneliness and Social Dissatisfaction Questionnaire (Asher, Hymel, & Renshaw, 1984), and the Youth Self-Report Form (YSR; Achenbach, 1991). Latent class analyses revealed that the chronicity and stability of maternal depressive symptoms were related to adolescents' externalizing behaviors. More specifically, adolescents whose mothers had chronic, elevated and stable depressive symptoms, as compared to adolescents whose mothers

had a single depressive episode or unstable depressive symptoms, were found to exhibit higher externalizing problems and risky behaviors.

In contrast, another study found that an ethnically diverse sample of children and adolescents of mothers currently experiencing clinically elevated levels of depressive symptoms was at a higher risk for developing disruptive behavior disorders, but the severity and chronicity of the depressive symptoms did not have a significant impact on the relation between maternal depressive symptoms and child and adolescent disruptive behavior disorders (Pilowsky et al., 2006). Furthermore, whereas some research has found that the impact of maternal depressive symptoms on a child's mental health persists even when the depression attenuated (e.g., Billings & Moos, 1986; Lee & Gotlib, 1991), other research suggests that the treatment and remission of depressive symptoms among mothers is associated with fewer current diagnoses of mental illness disorders and symptoms among children, supporting the notion that changes in parental depressive symptoms occur concurrently with changes in child psychopathology and adjustment (Lovejoy et al., 2000; Weissman, 1983; Weissman et al., 2006). Therefore, while findings that a relation exists between maternal depressive symptoms and adolescents' aggression have been robust (e.g., Pilowsky et al., 2006), the nature of the development and continuity of the relation remain unclear because of mixed findings (e.g., Campbell et al., 2009; Pilowsky et al., 2006).

The direction of the effects in the relation between maternal depressive symptoms and adolescents' aggression has also been debated. Researchers have proposed three arguments. First, researchers posit that maternal depressive symptoms impact adolescents' aggression. Second, adolescents' aggression is proposed to influence maternal depressive symptoms. Third, researchers argue that a reciprocal relation exists between maternal depressive symptoms and adolescents' aggression. The following section first reviews the literature that suggests that

maternal depression is a cause of adolescents' aggression. This includes theoretical underpinnings and empirical support for two mechanisms that have been proposed to mediate this relation, specifically parenting practices and family functioning. Next, theoretical and empirical support for the argument that adolescents' aggression influences maternal depressive symptoms is reviewed. This includes the role of parenting practices and family functioning in mediating the relation between adolescents' aggression and maternal depressive symptoms. Lastly, literature is presented that suggests that a reciprocal relation exists between maternal depressive symptoms and adolescents' aggression. This includes theory and empirical evidence that supports that a reciprocal relation exists between maternal depressive symptoms and adolescents' aggression.

**The Impact of Maternal Depressive Symptoms on Adolescents' Aggression.** Some researchers have argued that maternal depressive symptoms are a cause of adolescents' aggression. One theory that has been proposed to explain this relation is social learning theory. Social learning theory is based on principles of observational learning and operant conditioning. More specifically, an adolescent's aggressive behaviors are viewed as learned, developed, and maintained by observing other individuals behaving aggressively and experiencing desirable outcomes. It has been argued that depressed mothers are more likely to engage in coercive or aggressive patterns of interaction, and an adolescent can learn and develop aggressive behaviors by observing his or her mother engage in aggressive behaviors (Bandura, 1977). If an adolescent observes another individual being aggressive and receiving a desirable outcome, the adolescent is more likely to use aggressive behaviors in the future (Bandura, 1977). Several studies have found that maternal depression symptoms are predictive of child and adolescent aggressive behaviors (e.g., Pilowsky et al., 2006). Researchers have also examined potential mechanisms

that could account for the relation between maternal depressive symptoms and adolescents' aggression. Two such mechanisms are parenting practices and family functioning.

***Parenting Practices as a Mediator.*** Researchers have argued that parenting practices account for the relation between maternal depressive symptoms and adolescents' aggression. In the present study, parenting practices are defined as specific parenting behaviors intended to shape a child's behavior. These behaviors are exhibited towards a child in specific situations during parent-child interaction, such as a mother talking to her child after school about his or her plan for the upcoming day (Wood, McLeod, Sigman, Hwang, & Chu, 2003). Parenting practices are distinct from parenting styles, which are global patterns of behavior over an extended period of time (Holden & Edwards, 1989). They are specific behaviors exhibited in specific situations and are generally measured using "time-delimited" self-report assessments or observations (Wood et al., 2003, p. 135). The following review of the literature examines the relation between maternal depressive symptoms, parenting practices, and adolescents' aggression with a particular focus on parenting practices as a mediator of the relation. First, theoretical underpinnings for the role of parenting practices in the relation between maternal depressive symptoms and adolescents' aggression are reviewed. Empirical support for the relation is presented, and the role of parenting practices as a mediator in the relation is then discussed. The review specifically focuses on parental discipline practices and parental monitoring and involvement because these factors have a strong evidence base in the literature and are examined in the proposed study.

Several theories have been proposed to explain the relation between maternal depressive symptoms, parenting practices, and adolescents' aggression. These include theories that explain specific links among maternal depressive symptoms, parenting practices, and adolescents' aggression, and theories that specifically support parenting practices as a mediator of the

relation. The interpersonal perspective has been proposed to explain how maternal depressive symptoms impact parenting practices. According to the interpersonal perspective, the effects of maternal depressive symptoms extend beyond the depressed mother and can impact her interactions with her adolescent. The interpersonal relationship between a mother and her adolescent is critical to an adolescent's development and maternal depressive symptoms can impact behaviors associated with the parent-child relationship (e.g., coercion or inconsistent discipline) (Lewis, 2000). Another theory, called the family stress theory, posits that maternal depressive symptoms mediate the relation between contextual factors (e.g., low socioeconomic status) and parenting practices. More specifically, maternal depressive symptoms serve as an additional stressor for mothers who experience contextual stressors and this, in turn, leads to impaired and maladaptive parenting practices (Boss, 2002). For example, a poverty-stricken mother who suffers from depression may be more likely to use harsh discipline or withdraw because of the stress that she is experiencing.

Learning theory has been proposed to explain how parenting practices influence adolescents' aggression. Learning theory traditionally includes three basic principles, including classical conditioning, operant conditioning, and observational learning or modeling. Operant conditioning, in particular, can be used to describe a parent's influence on adolescents' aggressive behaviors. Operant conditioning is a type of learning in which antecedents, behaviors, and consequences influence the development and changes in behaviors. Consequences that follow a behavior can impact the expression of the behavior, and antecedents serve the function of becoming a cue for different types of consequences and can influence the likelihood that a behavior will express itself (Bandura, 1977). For example, if a parent implements a parenting technique of yelling at an adolescent because he or she engaged in an aggressive behavior, this



attention can lead to an increase in the expression or intensity of an adolescent's aggressive behaviors.

Similarly, the coercive family processes model explains how parenting can impact adolescents' behavior problems. The coercive family processes model proposes that a parent and an adolescent influence each other's behavior through their responses to one another via principles of negative reinforcement (Patterson, 1982). According to this model, an adolescent learns that he or she will be rewarded with attention from a parent for exhibiting aggressive behaviors. Parental attention, which can include reprimanding or physical discipline, reinforces the aggressive behavior and can shape an adolescent's aggressive behavior in the future such that it can become more frequent or escalate. An adolescent's aggression is further reinforced when parenting is inconsistent or unpredictable, and this can subsequently influence how an adolescent develops and maintains relationships outside of the family system. If the adolescent's aggression is effective in stopping an undesirable parental behavior (e.g., parental nagging), it increases the likelihood of the adolescent repeating aggressive behaviors in the future (Patterson, 1982).

The maladaptive parenting techniques perspective has also been proposed to explain the relation between parenting practices and adolescents' aggression. According to this perspective, maladaptive parenting practices (e.g., ineffective discipline tactics) are linked to aggressive behaviors among adolescents because an adolescent develops affect regulation difficulties as a result of exposure to maladaptive parenting techniques (Cummings & Davies, 1994). More specifically, Zillman (1983) proposed that repeated exposure to negative and emotion-arousing interactions with a depressed parent contributes to the development of arousal-regulation difficulties because the adolescent learns to pair an arousal-inducing stimulus with negative provocation. This can lead to an adolescent using aggression in situations where he or she is

unable to regulate his or her emotions (Zillman, 1983). Consequently, maladaptive parenting techniques hinder an adolescent from developing healthy affect regulation, and this gives rise to aggressive behaviors in situations where the adolescent is provoked and unable to control aggressive reactions (Cummings & Davies, 1994).

Learning theory has also been proposed to explain how parenting practices can mediate the relation between maternal depressive symptoms and adolescents' aggression. More specifically, observational learning, or social learning, consists of an individual learning a behavior by observing another individual engaging in a particular behavior (Bandura, 1977, 1985). The social learning theory proposes that adolescents develop and maintain aggressive behaviors through direct observation of a depressed mother's parenting behaviors (e.g., hostile, irritable, or aggressive behaviors) (Bandura, 1977, 1985; Birmaher & Axelson, 1998; Gartstein & Fagot, 2003; Hops et al., 1987; Splete, 2006). Direct observations can include observations of a depressed mother's interactions with siblings or another parent and can consist of observations of emotional expression, emotion regulation, problem-solving strategies, and discipline strategies (Bandura, 1985; Dodge, 1990). It is hypothesized that a mother serves as an influential role model for an adolescent, and when an adolescent observes an individual being rewarded for aggressive behaviors, the adolescent will be more likely to imitate these behaviors in the future (Downey & Coyne, 1990; Grych & Fincham, 1990). For example, an adolescent may imitate the aggressive behaviors of a depressed mother who lashes out at her spouse and gets her way. Therefore, the influence that a depressed mother's distress and coercive behaviors have over the behaviors of other family members may encourage and reinforce an adolescent's own use of coercive behaviors (Downey & Coyne, 1990).

According to principles of reinforcement, negative reinforcement may play an important role in the relation between maternal depressive symptoms and adolescents' aggression. Negative reinforcement is thought to increase the frequency of an adolescent's aggressive behavior when a parent removes a negative stimulus or condition as a result of the adolescent's aggressive behaviors. It has been proposed that the negative reinforcement process begins when an adolescent is confronted with coercive parenting strategies from a parent (e.g., criticism). Once confronted with these parenting strategies, some adolescents respond with an aggressive reaction (e.g., temper tantrums and physical acting out). This aggressive reaction from the adolescent causes a parent to retract the parental demand, consequently reinforcing the adolescent's aversive behavior and changing the parenting practice (Patterson, 1982; Gartstein & Fagot, 2003). Therefore, when a parent responds to an adolescent's aggressive behaviors by stopping the negative interaction, the adolescent is reinforced for using aggressive behaviors to get his or her way in a situation. Similarly, when a parenting behavior (e.g., stopping the negative interaction or giving in) results in a decrease in the adolescents' aggression, the parenting behavior is reinforced. Research shows that depressed mothers are more likely to try to maximize immediate rewards for the adolescent (e.g. giving in to the adolescent's demand) and minimize the amount of effort and energy expended (e.g. not spending time compromising). Hence, when a conflict occurs in the future, the adolescent will be likely to use aggressive behaviors and a parent will be likely to stop the interaction to deal with the conflict because it worked to eliminate the negative interaction between the adolescent and the depressed parent in the past (Patterson, 1982).

Past empirical research examining the role of parenting practices within the relation between maternal depressive symptoms and youth aggression has primarily focused on infants

and children. More specifically, research has suggested that depressed mothers, as compared to nondepressed mothers, engage in a higher number of maladaptive parenting behaviors (e.g., negative, intrusive, withdrawn, coercive, poor parental monitoring), and maladaptive parenting behaviors, in turn, are associated with child conduct problems and antisocial and aggressive behaviors (Field, Healy, Goldstein, & Guthertz, 1990; Kilgore, Snyder, & Lentz, 2000; Lee, Thullen, & Hans, 2006; Loeber & Dishion, 1984; Patterson, 1982; Patterson & Southamer-Loeber, 1984). Research with children has also found more direct support for parenting practices as a mediator of the relation between maternal depressive symptoms and children's aggressive behaviors. For example, maternal positivity and parental discipline have been found to mediate the relation between maternal depressive symptoms and children's externalizing behaviors (Ewell Foster, Garber, & Durlak, 2008; Ghodsian, Zajicek, & Wolkind, 1984). Fewer studies have examined mediators of the relation within the adolescent population.

Empirical research has indicated that maternal depressive symptoms, adolescents' aggression, and parenting practices are linked. Maternal depressive symptoms have been found to have a significant impact on parenting practices. More specifically, studies have found that depressed mothers, as compared to nondepressed mothers, are more negative, irritable, critical, scolding, unsupportive, intrusive, aggressive, physically abusive, unresponsive, and inattentive with their children (e.g. Frye & Garber, 2005; Gelfand & Teti, 1990; Lovejoy et al., 2000). In addition, depressed mothers are more likely to be inconsistent, lax, and ineffective in child management and discipline, as well as more likely to use discipline and teaching strategies that require the least effort (e.g., conflict avoidance) (Cox, Puckering, Pound, & Mills, 1987; Cunningham, Benness, & Siegel, 1988; Forehand, Lautenschlager, Faust, & Graziano, 1986; Kochanska, Radke-Yarrow, Kuczynski, & Friedman, 1987; Zahn-Waxler, Iannotti, Cummings,

& Denham, 1990).

Parenting practices, in turn, have been linked to aggressive behavior among children of all ages (e.g., Bloomquist & Schnell, 2002; Dodge & Pettit, 2003). First, parental discipline practices have been found to be associated with adolescents' aggression. Sheehan and Watson (2008) examined the link between maternal discipline and children and adolescents' aggression within a predominantly Caucasian sample of mother-child dyads and found that aggressive maternal discipline predicted children and adolescents' aggression. Pagani and her colleagues (2004) examined the relation between parental verbal and corporal punishment and adolescents' verbal and physical aggression towards adolescents' mothers among a French-Canadian sample of adolescents and families. Parental verbal and corporal punishment in the past six months was associated with adolescents' verbal and physical aggression towards adolescents' mothers (Pagani et al., 2004).

The link between physical discipline and adolescents' aggression has varied across ethnic groups. Lansford and her colleagues (2004) examined the link between parental physical discipline and externalizing behaviors in a longitudinal study of a predominantly Caucasian and African American sample of parents and children (5 to 16 years of age). The study found that early physical discipline at age five was predictive of higher levels of an adolescent's externalizing behaviors among Caucasian adolescents and lower levels of externalizing behavior problems among African American adolescents. More specifically, early physical discipline was associated with higher levels of externalizing behaviors, reactive aggression, school trouble, and police trouble among Caucasian adolescents, but with lower externalizing behaviors among African American adolescents. Furthermore, higher rates of parental physical discipline in sixth and eighth grade were associated with higher externalizing behaviors, reactive aggression, and

violence among Caucasian adolescents. In contrast, higher levels of parental physical discipline in sixth and eighth grade were associated with lower levels of violence among African American adolescents (Lansford et al., 2004).

The relation between parental discipline practices and adolescents' aggressive behaviors has not been supported across all studies. One study examined the relation between parental harsh punishment and youth adjustment and behavior problems among a nationally representative sample of families (Amato & Fowler, 2002). Contrary to what would be expected, the study found that higher levels of harsh punishment used by mothers were associated with lower rates of an adolescent's adjustment and behavior problems. However, this relation was not found for fathers (Amato & Fowler, 2002). Simons and his colleagues (1994) examined the relation between parents' harsh corporal punishment and adolescents' aggression among a sample of Caucasian families in the Midwestern region of the United States. The study found that parents' harsh corporal punishment was not associated with adolescents' aggression (Simons et al., 1994).

Management practices within a family (e.g. levels of supervision, discipline, clear communication of expectations from parent to child, and praise and reinforcement) have also been linked to aggression among adolescents. Herrenkohl and his colleagues (2006) examined the relation between family management trajectories and adolescent violent offending trajectories among an ethnically diverse sample of families (48% European-American, 25% African-American, and 22% Asian or Pacific Islander). Three trajectories were identified. Adolescents in families with low family management were more likely to follow chronic violent trajectories that increased later in adolescence. On the other hand, adolescents in families with stable and highly positive family management were more likely to follow a nonviolent trajectory.

Lastly, adolescents in families with low family management that changed to high family management across the course of the study followed a nonviolent trajectory and exhibited a similar trajectory to adolescents who consistently experienced high family management (Herrenkohl et al., 2006).

Research has also found that parental monitoring and involvement are associated with child and adolescent adjustment and behavior problems. More specifically, a nationally representative study found that higher levels of parental monitoring and involvement were associated with lower child adjustment and behavior problems (Amato & Fowler, 2002). MacMillan and Violato (2008) examined parental social support and an adolescent's emotional and behavioral competence among a sample of Canadian families and found that a parent's level of social support was predictive of an adolescent's emotional and behavioral competence two years later. In addition, Pettit and his colleagues (2001) examined the longitudinal relation between maternal monitoring and later externalizing behaviors within a predominantly Caucasian, middle-class sample of mothers and adolescents. Higher maternal monitoring was predictive of lower adolescent delinquent behavior problems (Pettit et al., 2001). Similarly, Simons-Morton and his colleagues (2008) examined the influence of parental monitoring within a predominantly Caucasian sample of families and found that low parental monitoring was associated with higher levels of conduct problems among adolescents. Orpinas and her colleagues (1999) also examined the relation between parental monitoring and aggressive behaviors within a predominantly minority, urban sample of adolescents and their families (66% Hispanic and 19% African American). The study found an inverse relation between parental monitoring and an adolescent's aggressive behaviors (e.g., aggression, fighting, injuries due to fighting, and weapon carrying) (Orpinas et al., 1999).

Several studies have supported the notion that parenting practices mediate the relation between maternal depressive symptoms and aggression among adolescents. Parental monitoring, in particular, has been found to mediate this relation across several studies (Dumas & Wekerle, 1995; Miller, Cowan, Cowan, Hetherington, & Clingempeel, 1993; Strassberg, Dodge, Pettit, & Bates, 1994). Langrock and colleagues (2002) examined the relation between parental depression, adolescents' aggression, and parental practices within a predominantly Caucasian sample of children and adolescents. Parental depressive symptoms were positively correlated with parental withdrawal and intrusiveness, and parental withdrawal and parental intrusiveness were positively associated with youth aggression (Langrock et al., 2002).

Studies have also specifically found that discipline practices mediate the relation between maternal depressive symptoms and adolescents' aggression. Discipline practices include parental behaviors, guidance, or instruction aimed at teaching children how to behave in a certain manner. Several studies have found that depressed mothers are more likely to use physical punishment, and this is associated with antisocial behaviors, aggression, disobedience, and behavioral problems among their offspring (Deater-Deckard et al., 1996; Larzelere, 1986; McLeod & Shanahan, 1993; Strassberg et al., 1994; Straus, Sugarman, & Gils-Sims, 1997; Turner & Finkelhor, 1996). Robila and Krishnakumar (2006) examined the impact of maternal depressive symptoms on parenting behaviors among a sample of Romanian mother-adolescent dyads. Higher levels of maternal depressive symptoms were associated with higher levels of maternal behavioral control (setting limits, monitoring an adolescent, and providing an adolescent with structure), and higher levels of behavioral control were, in turn, associated with higher levels of externalizing behaviors among adolescents (Robila & Krishnakumar, 2006). Barry and her colleagues (2009) examined inconsistent discipline as a mediator of the relation between



maternal depressive symptoms and preadolescent and adolescent boys' aggression within a predominantly African American (59%) and Caucasian (41%) sample of boys and their families. Inconsistent discipline partially mediated the relation between maternal depressive symptoms and preadolescent and adolescent boys' aggression. Another study used a cross-sectional design to examine competing models of the relations among maternal depressive symptoms, parenting practices, family functioning, and adolescents' aggression within a predominantly minority, high-risk sample of adolescents and their families (Pugh & Farrell, 2011). Parenting and family functioning variables (e.g., discipline effectiveness and reactivity in family communication) were found to mediate this relation, with clearest effects for parenting practices (Pugh & Farrell, 2011).

In conclusion, theoretical underpinnings and previous studies have supported that a relation exists between maternal depressive symptoms, parenting practices, and adolescents' aggression. Maternal depressive symptoms have been linked to interpersonal difficulties, maladaptive parenting styles, and ineffective parenting techniques (e.g. Gartstein & Fagot; Lovejoy et al., 2000). In addition, research has identified specific parenting practices (including maladaptive discipline practices and poor parental monitoring and involvement) that are associated with adolescents' aggression (e.g., Amato & Fowler, 2002; Fite, Colder, Lochman, & Wells, 2006). Finally, the existing research on mediators of the relation has identified parental monitoring and involvement and parent discipline practices as potential mediators in the relation between adolescents' aggression and maternal depressive symptoms (e.g., Pugh & Farrell, 2011).

***Family Functioning as a Mediator.*** The second mechanism that has been proposed to account for the relation between maternal depressive symptoms and adolescents' aggression is family functioning. The role of the family unit is to provide a child or adolescent with a stable,

cohesive, and predictable home environment (Cummings, Davies, & Campbell, 2000). The stability of the family unit is disrupted when events occur within the family that upset the continuity, cohesiveness, and predictability within the family (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Forman & Davies, 2003). The two main areas of research related to family functioning include family discord and marital discord. Family discord consists of disruption in the relationships between parents or between the parent and the child. Marital discord has been defined as, “conflict, disharmony, and lack of parental agreement” (Reid & Crisafulli, 1990, p. 107). This includes conflict between married or separated parents, but does not include divorced parents (Reid & Crisafulli, 1990).

The following review of the literature examines the relation between maternal depressive symptoms, family functioning, and adolescents’ aggression with a particular focus on family functioning as a mediator of the relation. The primary focus is on research with adolescents because it is most relevant to the focus of the present study. Theoretical support for the role of family functioning in the relation between maternal depressive symptoms and adolescents’ aggression is first reviewed. Next, empirical support for the relation is examined and the role of family functioning as a mediator of the relation is discussed. Family communication patterns (e.g., reactivity and conflict in family communication patterns) and family cohesion are specifically addressed because they have substantial empirical support in previous research and were included in the proposed study.

Three theories have been proposed to account for the relation between maternal depressive symptoms, family functioning, and adolescents’ aggression. These include theories that explain part of this relation, as well as those that support parenting practices as a mediator of the relation. The interpersonal perspective can explain how maternal depressive symptoms

impact family functioning. More specifically, maternal depressive symptoms can impact a mother's interactions with her adolescent and other family members, such that a depressed mother may engage in more negative and critical interpersonal interactions (Lewis, 2000). These negative interpersonal reactions impact the functioning of the family unit, such that family members may withdraw or engage in a negative pattern of interaction with a depressed mother.

A second theory, called the family systems approach, has been used to explain the relation between family functioning and adolescents' aggression. According to the family systems approach, an adolescent's aggressive behaviors are reflective of disturbances within the family because each family member functions interdependently with one another. More specifically, an adolescent's aggressive behaviors are a function of the organization of the family system, and the dynamics of the family (e.g., communication, structure, and interactive patterns) contribute to an adolescents' aggression (Corsini & Wedding, 2000). Finally, the coercive family process model has been proposed to explain the relation between family discord and adolescents' aggression (Patterson, 1982). More specifically, researchers have proposed that adolescents' aggression and family functioning can influence each other in a reciprocal manner, such that adolescents' aggression can impact the functioning of the family and the functioning of the family can influence an adolescent's aggressive behaviors (Patterson, 1982).

Similar to the research on parenting practices, research on the role of family functioning has primarily focused on studying children. Research studying children has found that several variables associated with family functioning, including family organization, family instability, and marital discord, are predictive of externalizing and aggressive behaviors among children (Ackerman et al., 1999; Harrist & Ainslie, 2008; Johnson, Cowan & Cowan, 1999). Moreover, a review of the literature found that maternal depressive symptoms were associated with

maladaptive family conditions (e.g. marital and family discord), which were, in turn, linked to a number of problems among children, including emotional dysregulation, aggression, and noncompliance (Gelfand & Teti, 1990). Several studies have directly examined the extent to which family functioning variables such as cohesion and conflictual parent relationships mediate or partially mediate the relation between maternal depressive symptoms and a child's aggression and externalizing behaviors (e.g., Fendrich et al., 1990).

Maternal depressive symptoms are associated with lower levels of family cohesion and organization, poorer family functioning, and increased conflict between family members (e.g., Fendrich et al., 1990; Timko et al., 2002). They have also been linked to poorer family communication, including family conflicts and arguments (e.g., Fendrich et al., 1990; Timko et al., 2002). One study compared home observations of family interactions in families with a clinically depressed mother and families with a nondepressed mother (Hops et al., 1987). Families with a depressed mother experienced higher rates of aversive exchanges, including higher rates of dysphoric affect and lower rates of happy affect during interactions with their children and spouses (Hops et al., 1987). Hammen and Brennan (2002) examined the interpersonal dysfunction experienced by a sample of currently and formerly depressed mothers and found these women to experience lower rates of marital stability, as compared to never-depressed mothers. The study also found that formerly depressed women had poor marital satisfaction, reported more spouse coercion, had more problematic relationships with family, and reported more stressful life events related to interpersonal conflict (Hammen & Brennan, 2002).

Research has also found support for the relation between family functioning (e.g., marital violence and family cohesion and structure) and adolescents' aggression (e.g., Gorman-Smith, Tolan, Henry, & Florsheim, 2000; McCloskey & Lichter, 2003). Research has indicated that

children and adolescents of depressed parents who experience family discord are at a higher risk for aggressive outcomes (e.g., Cummings & Davies, 1994; Downey & Coyne, 1990; Sheeber & Sorensen, 1998). Letourneau and her colleagues (2009) examined the role of family functioning in the development of aggressive behaviors among preadolescents who were exposed to maternal postpartum depression within 2 years of their birth. Higher levels of family dysfunction were associated with higher levels of aggression.

Researchers have also examined the role of family communication patterns in the relation between family functioning and adolescents' aggression. Reese-Weber and Kahn (2005) examined conflict resolution within a predominantly Caucasian sample of adolescents and their families. Parents' negative conflict resolution, such as attacking and avoidance, was predictive of an adolescent's negative conflict resolution with siblings and romantic partners in both intact and divorced families. In another study, Andrews and his colleagues (2000) examined the relation between family conflict and later aggressive outcomes in young adult couples within a predominantly Caucasian sample of adolescents and their families. Aversive family communication was found to be predictive of aversive communication and physical aggression in adolescents' future romantic relationships.

McCloskey and Lichter (2003) examined the relation between marital violence and aggression among Caucasian and Hispanic adolescents. The study found that exposure to marital violence during childhood predicted aggression toward peers among a sample of Caucasian and Hispanic adolescents. In addition, marital violence also predicted aggression between parents and children (McCloskey & Lichter, 2003). Similarly, Jouriles and his colleagues (1988) found that aggression between parents and children was predictive of later child conduct problems. In addition, a meta-analysis examined the relation between marital discord and youth behavior

problems within a predominantly Caucasian sample of children and adolescents from lower-middle and middle class families (Reid & Crisafulli, 1990). Marital discord was found to be positively correlated with child behavior problems, and this relation was stronger for boys than for girls and also among parent-report, as compared to reports from external sources (Reid & Crisafulli, 1990).

Contrary to the argument made in the present paper, researchers have also found that a relation does not exist between family functioning (e.g., family conflict and interaction) and adolescents' aggression. McClellan and her colleagues (2004) examined the influence conflict between parents on adolescents' aggression among a Colombian sample of high school students. Neither overt nor covert parental conflict was found to be associated with adolescents' aggression. Another study found that a family's level of fighting behavior and family communication about violence was not predictive of adolescents' aggression (Swaim, Henry, & Kelly, 2006). In addition, Brody and Flor (1996) did not find a relation between quality of family interaction and adolescent externalizing behaviors.

Several studies have examined the role of family functioning variables as mediators of the relation between adolescents' aggression and maternal depressive symptoms. In one study, Fendrich and his colleagues (1990) examined the relation between family risk factors, parental depression, and child and adolescent psychopathology within a predominantly Caucasian sample of families. Families with a depressed parent, as compared to families with a nondepressed parent, experienced lower levels of family cohesion, which in turn were associated with higher rates of child and adolescent conduct disorders (Fendrich et al., 1990). Davies and Windle (1997) examined gender differences in the relation between maternal depressive symptoms, family discord, and adolescent psychological adjustment (e.g. delinquent behavior and conduct

problems) within a predominantly Caucasian sample of adolescents and their families. Family discord mediated the relation between maternal depressive symptoms and adolescent girls' conduct problems. However, this relation was not found for boys (Davies & Windle, 1997).

Davies and his colleagues (1999) examined the relation between maternal depressive symptoms, marital discord, and adolescent externalizing behaviors (e.g. substance use, violation of rules and laws, aggressiveness, and disruptiveness) within a predominantly Caucasian sample of families. Their study suggested that the relation between maternal depressive symptoms and adolescents' externalizing problems was mediated by marital discord (Davies et al., 1999). In addition, Miller and his colleagues (1993) examined the relation between maternal depressive symptoms, the quality of the parents' relationship, and externalizing behaviors within a predominantly Caucasian, low to middle class sample of families. They found that the relation between maternal depressive symptoms and externalizing behaviors among preschoolers and adolescents was mediated by the quality of the mother's and father's relationship (e.g. couple affection and couple conflict). More specifically, mothers who were currently depressed had less positive and more conflictual relations with their husbands, which in turn predicted more externalizing behaviors among children.

In contrast to these findings, Langrock and her colleagues (2002) examined the relation between parental depression, marital discord, and aggressive behaviors within a predominantly Caucasian sample of children and adolescents. Parental depressive symptoms were positively correlated with marital discord, but marital discord was not found to be associated with youth aggression (Langrock et al., 2002).

In conclusion, previous studies have indicated that a relation exists between maternal depressive symptoms, family functioning, and adolescents' aggression. Maternal depressive

symptoms have been linked to lower levels of family cohesion, poorer family communication, and increased conflict between family members. Poor family functioning, in turn, has been associated with aggressive outcomes among youth (e.g., Fendrich et al., 1990; McCloskey & Lichter, 2003; Timko et al., 2002). Previous studies have specifically identified family functioning variables, including conflictual family communication patterns and poor family cohesion, as mediating the relation between maternal depressive symptoms and adolescents' aggression (e.g., Miller et al., 1993).

**The Impact of Adolescents' Aggression on Maternal Depressive Symptoms.** Some researchers have theorized that maternal depressive symptoms are associated with adolescents' aggression because adolescents' aggression influences maternal depressive symptoms. Cognitive theories have been proposed to explain how adolescents' aggression could impact maternal depressive symptoms. Seligman's (1975) learned helplessness theory posits that individuals develop depression in response to having a lack of control or inescapable events in their environment. Individuals who experience learned helplessness may blame themselves for not being in control of events, and this can then lead to chronic depression. Adolescents are rebellious and impulsive, and adolescents can cause serious injury to a parent because of his or her size. Mothers who have to deal with adolescents being aggressive towards them or others may feel like they do not have control over their child and environment. This loss of control and feelings of hopelessness is theorized to lead to depressive symptoms (Seligman, 1975). Empirical research has supported that a relation exists between maternal depressive symptoms and adolescents' aggression, but the direction of the effects has been vastly understudied (e.g., Pugh & Farrell, 2011). In one study, Pelham and his colleagues (1997) examined the effects of adolescents' disruptive behaviors (attention deficit hyperactivity disorder, conduct disorder, and



opposition defiant disorder behaviors) on parental depressive symptoms among a sample of 60 parents. Parents were asked to interact with a confederate adolescent boy who either exhibited normative behaviors or disruptive behaviors. Parents who interacted with an adolescent who exhibited disruptive behaviors were found to report significantly higher levels of depressive symptoms.

Potential mechanisms that could account for the relation between adolescents' aggression and maternal depressive symptoms have been understudied. Studies have primarily focused on the roles of parenting and family functioning as a mediator of the impact of maternal depressive symptoms on adolescents' aggression rather than of the impact of adolescents' aggression on maternal depressive symptoms. The existing empirical research has focused on a part of the relation between adolescents' aggression, parenting practices and family functioning, and maternal depression. More specifically, it has examined how adolescents' aggression can impact parenting practices and family functioning, and there is a paucity of research on how parenting practices or family functioning influences maternal depressive symptoms.

When considering how adolescents' aggression impacts parenting practices, Fite and her colleagues (2006) suggested that parents can become discouraged or hopeless about implementing parenting practices (e.g., disciplining their child) when an adolescent responds aggressively. This can lead to changes in parenting behaviors (e.g., inconsistent discipline practices or decreases in supervision and closeness) because a parent changes his or her parenting behaviors in response to adolescents' aggressive behaviors. Studies have found support for this relation. Fite and her colleagues (2006) examined the relation between parenting and boys' externalizing behaviors within a predominantly African American (54%) and Caucasian (45%) sample of boys (children and adolescents) and their families. Boys' externalizing

behaviors predicted poor parental monitoring from fifth to sixth grade and from sixth to seventh grade, as well as inconsistent parental discipline at all grade levels (fourth to eighth grade).

Boys' externalizing behaviors did not predict parental involvement or positive parenting.

As previously discussed, the impact of adolescents' aggression on family functioning is consistent with the coercive family processes model (Patterson, 1982). More specifically, researchers have proposed that adolescents' aggression and family functioning can influence each other in a reciprocal manner, such that adolescents' aggression can impact the functioning of the family. For example, an adolescent with aggressive behaviors can contribute to increases in family conflict (Patterson, 1982). Dumas, Blechman, and Prinz (1994) examined family communication effectiveness and aggression within a predominantly Caucasian sample of early adolescents. Child behavior problems were found to impact marital quality, such that higher levels of child behavior problems were associated with lower levels of marital satisfaction (Cui et al., 2007; Leve, Scaramella, & Fagot, 2001).

In conclusion, there is limited research on the impact of adolescents' aggression on maternal depressive symptoms, and research on potential mechanisms that may mediate the relation is lacking. The existing theoretical and empirical support for this relation is promising. However, it is clear that more research needs to be conducted to confirm or disconfirm if and how adolescents' aggression impacts maternal depressive symptoms.

### **Reciprocal Relation between Maternal Depressive Symptoms and Adolescents' Aggression**

A third model to explain the relation between maternal depressive symptoms and adolescents' aggression is that they influence one another in a mutual and bidirectional manner (e.g., Sameroff, 1975). This approach allows researchers to examine the developmental continuities and bidirectional cause and effect relations between maternal depressive symptoms

and adolescents' aggression. Because this area of research is emerging, there are a limited number of theories and empirical studies to support this notion. The following review of the literature provides a critical analysis of the current literature on the reciprocal relation between maternal depressive symptoms and adolescents' aggression. First, theoretical underpinnings for the reciprocal framework are presented. Second, empirical research is discussed, including an analysis of the underlying theories, study design, sample characteristics, results, and key methodological limitations for each study.

A reciprocal framework proposes that an adolescent's development can be influenced by a bidirectional interaction between an adolescent (e.g., aggressive behaviors) and their environment (e.g., parenting characteristic of maternal depressive symptoms) (Sameroff, 1975). Researchers have specifically proposed that aggressive behaviors among youth can shape parenting behaviors (e.g., a parent has an aversive reaction or backs off) in a similar manner that parenting factors can influence adolescents' aggression (e.g., Patterson, 1982). Researchers have argued that maternal depressive symptoms and an adolescent's aggressive behaviors affect one another in a reciprocal and dynamic fashion, such that maternal depressive symptoms can influence the development of an adolescent's aggressive behaviors and an adolescent's aggressive behaviors can influence the development of maternal depressive symptoms. Both an adolescent and the environment can influence, adapt to, or change the subsequent development of the other component over time. For example, a depressed mother may reinforce an adolescent's aggressive behaviors by not enforcing compliance or withdrawing when an adolescent acts out. An adolescent's aggressive behaviors may in turn help to sustain maternal depressive symptoms by creating additional distress for a mother. These patterns can become pervasive and chronic and continue to reciprocally influence one another (Patterson, Reid, &

Dishion, 1992; Sameroff, 1975).

Similarly, control systems theory (Bell, 1977) argues that a parent and an adolescent are sensitive to the behaviors of the other and have a certain tolerance for the other's behaviors. More specifically, when an adolescent's aggressive behaviors reach the upper limit of a parent's tolerance level, a mother's reactions are activated and she will respond with behaviors like being controlling or withdrawn. On the other hand, when an adolescent's inactive or nonaggressive behaviors reach the lower limit of a parent's tolerance level, a parent will respond with behavior like stimulation or engagement. An adolescent will also react to a parent's behaviors when they have reached an upper or lower limit to their tolerance level, therefore displaying a reciprocal adaptation to behaviors between an adolescent and a parent (Bell, 1977).

A reciprocal framework has also guided theories about how characteristics of parents and children both contribute to dysfunctional parenting (Belsky, 1984). More specifically, parenting behaviors are proposed to be influenced by a number of characteristics of a parent, such as personality and psychological well-being. Characteristics of children are also proposed to shape parenting behaviors, such that a characteristic of a child, like aggression, can make a child more difficult to care for and shape a parent's quality and quantity of parenting behaviors (e.g., decreased discipline).

A family systems approach has also been proposed to explain the reciprocal relation between maternal depressive symptoms and adolescents' aggression. According to the family systems theory, family members are interdependent on one another and operate like a system. Each family member contributes to the whole family, and the family unit is proposed to be, "greater than the sum of its parts" (Corsini & Wedding, 2000, p. 376). Changes that occur in one part of the family are proposed to impact other family members and therefore influence the

family system. An aggressive adolescent reflects disturbances within the family unit (Corsini & Wedding, 2000). When a challenge arises in the family, the family unit is organized to cope with the challenge by adjusting to the needs of other family members. According to the family systems approach, the distress of maternal depressive symptoms can impact the entire family and create family discord and tension as the family copes with the disruption to the normative family patterns. This disruption in the family system, in turn, can serve to maintain a mother's depressive symptoms (Corsini & Wedding, 2004). A theory that taps into these dynamic processes is Coyne's interpersonal theory of depression. According to this theory, a depressed mother exhibits negative interpersonal behaviors that can negatively impact the functioning of the family system, specifically that it can cause other family members to react negatively to and reject a depressed mother. This, in turn, causes a depressed mother to feel more depressed (Coyne, Kahn, & Gotlib, 1987).

Similarly, the coercive family processes model proposes that family members influence each other's behavior through their responses to one another and coercive and dysfunctional interactions among family members impact how adolescents develop and maintain relationships inside and outside of the family. Therefore, aggressive patterns of interactions that occur inside the family are also generalized by the adolescent to situations outside of the home environment (Patterson, 1982). Similarly, the family interactions patterns theory holds that an adolescent's aggression is maintained because of maladaptive family interaction patterns experienced within the home (Steinglass, 1987).

Studies using a reciprocal framework have often focused on how maternal depressive symptoms and adolescents' aggression mutually influence one another. Several studies have used correlational analyses or treatment evaluations studies of how treatment of maternal depressive

symptoms lead to changes in children's behavior (Jaffee & Poulton, 2006; Sanders, Markie-Dadds, Tully, & Bor, 2000; Sanders & McFarland, 2000). For example, in one study, researchers found that the treatment and remission of depression among mothers is associated with fewer current diagnoses of psychopathology and symptoms among children (Weissman, 1983; Weissman et al., 2006).

Based on the notion that adolescents' aggression is the result of multiple mutually influential factors between a mother and her child, one study examined the longitudinal relation between maternal functioning (depressive symptoms, degree of impairment, and negative and nonconstructive communication with child), child characteristics (child behavior, child self-concept, and child age), and child maladjustment (psychopathology and behavior problems) (Hammen, Burge, & Stansbury, 1990). The study included a predominantly Caucasian, middle and upper middle class sample of children and adolescents and their mothers ( $N = 64$ ). Mothers in the sample were recruited from specialty clinics, hospitals, and private practices, and were currently in treatment for recurrent or chronic unipolar depression or bipolar disorder. Participation in the study occurred at least 3 months following the start of treatment or admission to the hospital. A comparison group was recruited from schools with populations that were demographically similar to the sample of depressed mothers (Hammen et al., 1990).

Maternal depression and functioning was assessed at intake and at a 6-month follow-up using maternal report of the Schedule for Affective Disorders and Schizophrenia-Lifetime version (SADS-L; Endicott & Spitzer, 1979), Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and Social Adjustment Scale (SAS; Weissman & Bothwell, 1976). Children and adolescents' psychopathology was assessed using youth and maternal report of the Kiddie-SADS (K-SADS; Puig-Antich, Chambers, & Tabrizi, 1983) and

behavior problems were assessed using maternal report of the Child Behavior Checklist (CBCL; Achenbach, 1978) and Piers-Harris Children's Self-Concept Scale (Piers & Harris, 1969). Finally, a mother-child interaction task between a mothers and her child that consisted of discussing a topic that they disagreed upon was coded for content.

A hypothesized model was evaluated using structural equation modeling to examine the reciprocal relation between maternal functioning and child characteristics. The model hypothesized that maternal functioning (maternal positivity and constructivism in the parent-child interaction task, depressive symptom levels on the BDI and a functioning score on the SAS) and child characteristics (child behavior, child self-concept, and child age) mutually influenced one another. In addition, maternal functioning and child characteristics were hypothesized to have a direct effect on child outcome, as measured by social competence and behavior problems on the CBCL and a child's diagnosis. The model was found to fit the data well. Therefore, a reciprocal, causal relation between maternal functioning and child characteristics was supported, and maternal functioning was found to contribute to the development of psychopathology and behavior problems in children and adolescents. In addition, a child or adolescent's age and self-concept were found to be associated with maternal functioning, such that older youth and youth with a more negative self-concept had mothers who experienced significantly higher dysfunction. Therefore, this model indicates that there is a mutual and reciprocal cycle between maternal functioning and youth characteristics, and maternal functioning, in turn, contributes to later psychopathology or behavior problems among children and adolescents (Hammen et al., 1990).

There are, however, several limitations to the design of the study by Hammen and colleagues (1990) that could bias the findings. First, the recruitment of mothers was nonrandom

and depressed mothers were in treatment for at least 3 months before they participated in the study. The homogeneity of the sample also limits the generalizability of the findings to middle and upper middle Caucasian families. Finally, the study defined maternal and adolescents' functioning as a combination of various characteristics and behaviors and this can limit the understanding of what is specifically driving the mutual influences (Hammen et al., 1990).

A study by Ge and colleagues (1995) examined the mutual influences of parent and adolescent psychological distress within a predominantly Caucasian, rural, lower-middle to middle class sample of adolescents and their families. Families ( $N = 368$ ) were recruited through schools and completed self-report symptom checklist measures at three waves one year apart. Parent and adolescent psychological distress was a latent variable defined as symptoms of depression, anxiety, and hostility. Based on an ecological and developmental perspective (e.g., Bronfenbrenner, 1979), it was hypothesized that an adolescent's psychological distress would develop partly as a reaction to parental distress and would also contribute to parental distress. Structural equation modeling was used to examine a three-wave cross-lagged effect model, and significance of the stability coefficient was used as an indicator of the relation between adolescents' and parental distress. Results indicated that maternal psychological distress at Time 1 was significantly related to adolescent boys' distress at Time 2, and adolescent boys' distress at Time 1 was significantly associated with maternal distress at Time 2 ( $\beta_s = .17$  to  $.20$ ). This relation was not significant for mothers and daughters (Ge et al., 1995). Therefore, this study supports the argument that mothers and male adolescents can reciprocally influence the psychological well-being of each other. However, the findings of this study have limitations in generalizability because of the homogeneous sample and the use of self-report data. In addition, the study used global measures of maternal and adolescents' psychological distress instead of



focusing on specific behaviors like aggression or depression, and this can limit the understanding of what is specifically influencing maternal and adolescents' psychological distress.

Studies have also specifically examined the bidirectional relation between maternal depressive symptoms and adolescent boys' disruptive and antisocial behaviors. Gross and her colleagues (2009) used Coyne's interpersonal model of depression as a framework to examine the dynamic interplay in the relation between maternal depressive symptoms and youth disruptive behaviors from infancy to adolescence (Coyne et al., 1987). Participants included a predominantly Caucasian (55%) and African American (40%) sample of boys and their families ( $N = 310$ ) from the Allegheny Country Women, Infants, and Children Program in the Pittsburgh Metropolitan area. Assessments were conducted at 1.5 years, 2 years, 3.5 years, 5 years, 5.5 years, 6 years, 8 years, 10 years, 11 years, and 12 years of age. Maternal depressive symptoms were assessed using the BDI (Beck et al., 1961). Youth aggressive behaviors were assessed using structured tasks that varied by stress level (e.g., Strange Situation versus free play) and aggressive behaviors were coded during each task (e.g., aggression directed towards mother, examiner, or toys). A total aggression score was calculated by collapsing the number of aggressive behaviors across situations and types of aggression into one score. Aggressive behaviors were also assessed when adolescents were 11 to 13 years old using self-report of delinquent behaviors (Self-Reported Delinquency) and teacher's report of problem behavior (the Teacher Report Form; Achenbach & Rescorla, 2001) (Gross et al., 2009).

A semiparametric, group-based approach was first used to model different trajectory groups based on levels of maternal depressive symptoms when her child was certain ages. Next, an analysis of variance (ANOVA) was used to determine if early aggressive behaviors among youth were differentially associated with maternal depressive symptoms trajectory groups, and

an analysis of covariance (ANCOVA) was used to examine if maternal depressive symptoms trajectory groups were associated with aggressive behavior outcomes in early adolescence (ages 11 to 13). Results indicated that an infant's behaviors at 18 months old distinguished between maternal depressive symptoms trajectory groups, such that early child noncompliance was associated with a more chronic and severe maternal depressive symptoms trajectory. Maternal depressive symptoms trajectory group, in turn, was found to predict self- and teacher-report of boys' delinquent and noncompliant behavior. More specifically, boys of mothers' with moderately high levels of depressive symptoms had significantly higher externalizing symptoms than mothers with low or moderately low depressive symptomatology (Gross et al., 2009).

The study by Gross and her colleagues (2009) displayed several strengths, including being one of the few studies that have examine maternal depressive symptoms and youth disruptive and antisocial behaviors from a transactional perspective. In addition, the study included an ethnically diverse, working class sample of families, had high retention rates (89%), included reliable and valid measures, and assessed aggression using multiple informants. Furthermore, a longitudinal design allowed the researchers to examine the developmental continuities and cause and effect relations between maternal depressive symptoms and adolescents' delinquent and noncompliant behavior. In addition, in contrast to studies that have examined broader domains of maternal functioning (e.g., Campbell et al., 2009), the study examined the specific effects of maternal depressive symptoms on adolescent boys' antisocial and disruptive behaviors. However, there were also several limitations. First, the measures assessed fairly global domains of youth functioning that represent youth externalizing problems and do not isolate the specific behaviors that may be driving the findings. In addition, observations of aggressive behaviors were conducted at only one time point every 1 to 2 years.

This may not be representative of the child's behavior and could be confounded by situational variables (e.g., the child could be sick or tired that day; reactivity effects). Another weakness is that the sample only included boys, therefore limiting the generalizability of the findings. In addition, this study did not examine potential mechanisms that may account for the relation between maternal depressive symptoms and youth aggression (Gross et al., 2009).

In another research study, Gross and her colleagues (2008) used a reciprocal model of socialization framework (e.g., Sameroff, 1975) to examine the relation between maternal depressive symptoms and adolescent boys' disruptive and antisocial behaviors. The sample consisted of a predominantly Caucasian (53%) and African American (36%) sample of adolescent boys and their families ( $N = 310$ ) from the Women, Infants, and Children program. Assessments of maternal depressive symptoms were conducted at 5, 6, 8, 10, 11, 12, and 15 years using mothers' reports of the BDI (Beck et al., 1961) to measure maternal depressive symptoms. Youth aggression was assessed by maternal report of the Child Behavior Checklist (CBCL) and self-report of delinquent behaviors (Self-Reported Delinquency) when youth were 10, 11, 12, and 15 years old. A parallel processing model was first used to determine how maternal depressive symptoms and maternal perception of child and adolescent boys' aggressive behavior were related, and reciprocal effects between maternal depressive symptoms and boys' disruptive and antisocial behaviors were found. The model adequately fit the data, such that changes in rates of maternal depressive symptoms were related to changes in boys' overt disruptive behavior. An autoregressive path model was then used to examine the cross-lagged associations between maternal depressive symptoms and maternal perception of child and adolescent boys' disruptive and antisocial behaviors. Results specifically found evidence supporting the reciprocal effects in middle childhood and adolescence, such that reports of

maternal depressive symptoms at boys' ages 11 and 12 predicted boys' disruptive and antisocial behaviors at ages 12 and 15 ( $\beta$ s = .14 to .16) and boys' disruptive and antisocial behaviors at age 11 predicted higher levels of maternal depressive symptoms at age 12 ( $\beta$  = .11) (Gross et al., 2008).

The Gross et al. (2008) study adds to the current literature by providing evidence supporting reciprocal effects of maternal depressive symptoms and boys' disruptive and antisocial behaviors in middle childhood and adolescence. Because this study (Gross et al., 2008) used the same sample as Gross and her colleagues (2009), the strengths and limitations of the two studies are similar. More specifically, the study used an ethnically diverse sample, assessed multiple informants using reliable and valid measures, assessed specific behaviors and psychopathology among mothers and adolescents, and utilized a longitudinal design. Weaknesses of the study include sample limitations (e.g., only examined boys) and not examining potential mechanisms that could mediate the relation between maternal depressive symptoms and youth disruptive and antisocial behaviors (Gross et al., 2008).

Finally, a study by Jaffee and Poulton (2006) examined the longitudinal relation between mothers' depression and anxiety symptoms and youth antisocial behaviors within a predominantly Caucasian sample of children and adolescents and their families. Maternal depressive symptoms and anxiety and youth antisocial behaviors were assessed at 2 year intervals from the age of 5 to the age of 13. Psychological and physical symptoms of maternal depressive symptoms were assessed using the Malaise Inventory (Rodgers, Pickles, Power, Collishaw, & Maughan, 1999), and youth antisocial behaviors were assessed using the Rutter Child Behavior Scale (Rutter, Tizard, & Whitmore, 1970) for children and the Revised Behavior Problem Checklist (Quay & Peterson, 1987) for adolescents. Autoregressive cross-lagged models

were estimated for the relation between maternal depressive symptoms and youth antisocial behaviors.

Girls' antisocial behaviors predicted subsequent changes in maternal depressive symptoms across the time period and maternal depressive symptoms predicted girls' antisocial behavior from ages 5 to 7, 9 to 11, and 11 to 13 years old. The effect of maternal depressive symptoms on boys' antisocial behaviors was only present from ages 5 to 7 years old (Jaffee & Poulton, 2006). This study provides support for the notion that maternal depressive symptoms and adolescents' aggression mutually influence one another and it highlights how gender can play a role in this relation. Similar to previous studies, the strengths of this study includes using a longitudinal design, and specifically examining aggressive behaviors. The weaknesses include the homogeneity of sample characteristics and limitations with the generalizability of the findings, as well as not examining possible mechanisms that might mediate the relation (Jaffee & Poulton, 2006).

In conclusion, studies examining the reciprocal nature of maternal depressive symptoms and adolescents' aggression have displayed promising findings. This research has made a significant contribution to the literature because there was a paucity of theoretical underpinnings and empirical research on the effects of adolescents' behaviors on parenting behaviors and maternal psychopathology until this area of research emerged (Gross et al., 2008). With the research that does exist, a number of limitations have been identified. This includes there being a limited number of studies that, "have attempted to unravel temporal relations between maternal and child functioning" (Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004, p. 445). Studies have also tended to focus on global measures of dysfunction and there are a limited number of studies that have specifically examined aggressive behaviors. In addition, studies on the

reciprocal relation between maternal depressive symptoms and youth aggression have generally focused on infants and children and less work has been conducted with an adolescent population. There have also been sample limitations, including using a predominantly Caucasian sample and only focusing on adolescent boys (e.g., Gross et al., 2008). Finally, there is a paucity of studies that examine potential mechanisms that could mediate the reciprocal relation between maternal depressive symptoms and adolescents' aggression (e.g., Gross et al., 2008).

### **Subgroup Differences: Gender**

There is evidence to suggest that the relation between maternal depressive symptoms and adolescents' aggression may vary across different groups of adolescents. Several factors have been identified in past research as impacting the relation between maternal depressive symptoms, parenting practices, family functioning, and adolescents' aggression. It is important for future research to examine the role of these variables and investigate if and to what degree these variables may moderate the relation between maternal depressive symptoms and adolescents' aggression. Researchers have specifically proposed that the gender of a parent and an adolescent can play a role in the parent-child relationship. Boys and girls tend to be closer to and spend more intimate time with their mother, and the gender of an adolescent is also thought to influence how an adolescent interacts with his or her mother and father (Collins & Russell, 1991; Holmbeck, Paikoff, & Brooks-Gunn, 1995; Updegraff, McHale, Crouter, & Kupanoff, 2001).

Research exploring the role of gender in the relation between maternal depressive symptoms, family and parenting factors, and an adolescent's aggressive behaviors has displayed mixed findings (Erel & Burman, 1995; Reid & Crisafulli, 1990; Rothbaum & Weisz, 1994). Some studies have found that family risk factors affect youth consistently across gender (e.g., Cummings & Davies, 1994). Other research has found that family risk factors lead to different

outcomes for aggressive behavior problems among boys and girls, such that family risk factors were found to be associated with conduct problems only among boys (Dornfield & Kruttschnitt, 1992). One study examined the effects of witnessing violence across a 1 year period of time among a diverse sample of urban adolescents (Brookmeyer, Henrich, & Schwab-Stone, 2005). Parental support was found to be a protective factor against aggressive behaviors among male adolescents who witnessed violence, but not for female adolescents who witnessed violence (Brookmeyer et al., 2005). Another study on the reciprocal influences between maternal and child distress found boys' problem behaviors and psychological distress, as compared to girls, had a greater impact on mothers' distress (Ge et al., 1995). In addition, Griffin and his colleagues (2000) examined how gender moderated the relation between parenting factors and adolescents' aggressive and delinquent behaviors among an urban minority sample of adolescents and families. Gender moderated the relation between parenting behaviors and adolescents' delinquent and aggressive behaviors. More specifically, parental monitoring was associated with higher levels of delinquent behaviors among adolescent boys, and eating family dinners was associated with lower levels of delinquent and aggressive behaviors among adolescent girls (Griffin et al., 2000).

### **The Present Study**

Previous studies have highlighted the high prevalence of depression among mothers and the negative impact that it can have on adolescents' maladaptive behaviors, specifically aggression (e.g., Pilowsky et al., 2006). Two mechanisms that have been proposed to account for the relation between maternal depressive symptoms and adolescents' aggression are parenting practices and family functioning. First, it has been argued that maternal depressive symptoms impact parenting practices which then leads to aggression among youth (e.g., Barry et al., 2009;

Gelfand & Teti, 1990). Depressed mothers experience higher rates of difficulties in parenting (e.g., inconsistent discipline) and this has been found to be associated with adolescents' aggression (e.g., Hammen & Brennan, 2002). Parenting practices, including discipline practices and level of supervision, have been linked to aggressive and problem behaviors among youth (e.g., Sheehan & Watson, 2008). More direct support for this theory is provided by studies showing that parenting practices, such as inconsistent discipline practices and low parental monitoring, mediate the relation between maternal depressive symptoms and adolescents' aggression (e.g., Barry et al., 2009; Elgar et al., 2007).

The second proposed mechanism to account for this relation is family functioning. Maternal depressive symptoms are theorized to influence adolescents' aggression through their impact on family functioning (e.g., Timko et al., 2002). Maternal depressive symptoms have been specifically linked to poorer communication styles (e.g., family conflict and arguments) and lower levels of family cohesion (e.g., Fendrich et al., 1990; Timko et al., 2002). These, in turn, have been linked to increased rates of aggressive behaviors (e.g., Billings & Moos, 1985). Research has found direct support for family cohesion and conflictual parent relationships mediating or partially mediating the relation between maternal depressive symptoms and adolescents' aggression and externalizing behaviors (e.g., Fendrich et al., 1990).

Previous studies have often examined the relation between maternal depressive symptoms and adolescents' aggression with a focus on maternal depressive symptoms as a cause of adolescents' aggression. This fails to consider the possible influence of adolescents' aggression on maternal depressive symptoms. Studies have recently used a reciprocal framework to examine the relation between maternal depressive symptoms and adolescents' aggression (e.g., Gross et al., 2008, 2009). A reciprocal framework proposes that the development of



adolescents' aggression can be influenced by a bidirectional interaction between an adolescent and his or her environment (e.g., parenting characteristic of maternal depressive symptoms). Longitudinal studies have found that mothers and adolescents can reciprocally influence the behaviors and psychopathology of one another (e.g., Gross et al., 2008, 2009). These studies have made an important contribution to the literature and have provided findings about the developmental continuities and cause and effect relations between maternal depressive symptoms and adolescents' aggression. However, these studies have several limitations. These include using fairly global measures of youth externalizing behaviors, not examining specific behaviors that may account for the findings, and sample limitations (e.g., only including boys or using predominantly Caucasian samples). In addition, these studies have not examined potential mediators that may account for the reciprocal relation between maternal depressive symptoms and youth aggression (Gross et al., 2009).

The present study was designed to build upon the existing theoretical and empirical work and to address several limitations of previous studies. The purpose was to examine the reciprocal relation between maternal depressive symptoms and adolescents' aggression, and to investigate mediators that may account for this relation using longitudinal data. The present study aimed to explore four main hypotheses. First, it was hypothesized that a positive relation would be found between maternal depressive symptoms and adolescents' aggression within each time point. More specifically, higher levels of maternal depressive symptoms would be associated with higher levels of adolescents' aggressive behaviors. Second, it was hypothesized that a reciprocal relation would be found, such that maternal depressive symptoms would predict subsequent changes in adolescents' aggression and adolescents' aggression would predict subsequent changes in maternal depressive symptoms. Third, it was hypothesized that gender would

moderate the relation between maternal depressive symptoms and adolescents' aggression. Based on previous studies, it was proposed that the relation between maternal depressive symptoms and adolescents' aggression would differ by gender, such that the relationship would be stronger among male adolescents. Finally, it was hypothesized that parenting practices (parental monitoring and involvement and parental discipline practices) and family functioning (reactivity in family communication and family cohesion) would mediate the relation between maternal depressive symptoms and adolescents' aggression.

The present study was designed to address several gaps in the literature. First, in contrast to previous studies that have often focused on a single mechanism, the present study examined the unique contribution of parenting and family functioning factors that have been hypothesized to account for this relation. Second, the present study aimed to add to the literature by examining the reciprocal relation between maternal depressive symptoms and adolescents' aggression, and exploring potential mechanisms that could mediate the relation between adolescents' aggression and maternal depressive symptoms.

To address potential biases associated with examining relations among variables from a single source (e.g., maternal reports of depression, parenting factors, and adolescents' aggression), the present study used data on parenting practices and family functioning obtained from mothers and adolescents, and measures of adolescents' aggression based on reports from mothers, teachers, and adolescents. In contrast to previous studies that have examined the impact of maternal functioning on fairly global measures of adolescents' functioning that combine internalizing and externalizing problems (e.g., Campbell et al., 2009), the present study focused specifically on aggression. Such distinctions are important in that the specific effects of maternal depressive symptoms and the mechanisms by which it exerts its influence on adolescents'

functioning may differ across domains of behavior.

In addition, in contrast to previous studies that have employed relatively small samples from within a single school system, the present study examined data from a large sample of students from 18 schools at four different sites. This study also extended previous work that has tended to focus on predominantly Caucasian populations by focusing on a more diverse sample that included a high percentage of minority students from low to middle class families. Finally, the present study aimed to conduct analyses to examine gender differences in the patterns of relations among maternal depressive symptoms, parenting practices, family functioning and adolescents' aggression. This is particularly appropriate based on previous studies that have found stronger relations between family risk factors and behavior problems for boys (e.g., Reid & Crisafulli, 1990).

## **Method**

### **Settings**

The present study is based on 5 waves of data collected from the fall of 2001 to the spring of 2005 as a part of the Multisite Violence Prevention Project (MVPP), a study designed to evaluate violence prevention programs for middle school youth (Ikeda et al., 2004). Data were collected from two Cohorts of middle school students at 37 schools in the fall and spring of sixth grade and the spring of their seventh and eighth grade. An additional wave of data was collected from fall of seventh grade for Cohort 2. Sites included Durham, North Carolina, Richmond, Virginia, Northeastern Georgia, and Chicago, Illinois. The middle schools in the sample from Durham and Richmond (eight from each site) included nearly all the public middle schools in those cities. The nine middle schools from Georgia were from six school districts in the northeastern region of Georgia. The 12 schools from Chicago included kindergarten through

eighth grade students. Schools within each site were randomly assigned to one of four conditions: universal intervention, selective intervention, combined universal and selective intervention, and no-intervention control (see Ikeda et al., 2004 for details). Nineteen schools assigned to the selective treatment were not included in the present study because students and their families in these schools participated in a family intervention aimed at improving parenting and family functioning (MVPP, 2004). Therefore, students and families from 18 schools were included in the present study ( $N = 521$ ).

### **Participants**

Consistent with the goals of MVPP, eligible participants were students selected by sixth grade teachers based on having high rates of aggression and a high level of potential influence on peers. This included students chosen from two successive Cohorts who entered the sixth grade at participating schools in 2001 and 2002. The process for selecting the sample began with two core teachers from the sixth grade nominating sixth grade students they considered to be the most aggressive. The students were rated across a range of aggressive behaviors, including getting in physical fights, intimidating others, getting easily angered, and encouraging others to fight. Once 25% of the most aggressive students in each school were identified, the teachers were asked to rate the level of influence these students have on peers. Teachers rated a student's level of influence using a 5-point social influence scale based on the following behaviors: other students listening to them about attitudes, behavior, and values about what is important and cool; they are considered a trend-setter; other students respect them; and other students try to be like or imitate them. About 5% of sixth graders from each of two Cohorts were chosen from each school, with a minimum of 10 students, with the number of students selected from each school dependent on the size of the school (Durham [ $n = 18$ ], Richmond [ $n = 19$ ], Northeastern Georgia [ $n = 18$ ],

Chicago [ $n = 12$ ]).

A total of 1,679 students across the four sites met these criteria. Parent consent and student assent were obtained from 74% of the eligible students ( $N = 1,237$ ), and 98% of the consented students completed the measures ( $N = 1,217$ ). Data were obtained from 1,128 caregivers of the participating students. Because the focus of the study was on mothers' characteristics, the sample was restricted to the 927 students where caregiver ratings were obtained from mothers. As previously noted, the sample was further restricted to exclude students at schools assigned to the selective intervention because they participated in a family intervention that could influence the variables being examined in the present study (e.g., parenting practices and family functioning). The final sample included 521 students and their families (see Table 1). About 66% of students in the final sample were male. Their racial/ethnic distribution was 65% Non-Hispanic, African American; 13% Hispanic/Latino, 12% White, Non-Hispanic, and 12% multiracial or other race group. The racial/ethnic distribution of the mothers in the sample was 59% Non-Hispanic, African American; 11% Hispanic/Latino, 8% White, Non-Hispanic, and 22% multiracial or other race group. Many (43%) were single parents with the majority of the remainder living with the adolescent's father (31%) or stepfather (26%). About 23% of mothers had completed some of high school and 38% of the mothers were high school graduates or had a general education development (GED). A smaller percentage had graduated from college with an associate or bachelors degree (12%) or attained a post graduate education or degree (3%).

Table 1

*Descriptive Statistics: Characteristics of Students and Mothers*

	N	Percentage
<u>Students' Race/Ethnicity</u>		
Caucasian	47	10%
African American	341	65%
Hispanic	68	13%
Other Race	65	12%
<u>Students' Characteristics</u>		
Gender is Male	346	66%
Adult Male In Home	326	63%
<u>Mothers' Race/Ethnicity</u>		
Caucasian	44	8%
African American	306	59%
Hispanic	58	11%
Other Race	113	22%
<u>Mothers' Education</u>		
Eighth Grade or Less	18	4%
Some High School	95	23%
High School Graduate	161	38%
Some Post High School	85	20%
College Graduate	52	12%
Post College Graduate	13	3%
<u>Mothers' Relationship Status</u>		
Married to Father	166	31%
Living with Stepfather	140	26%

Note. N = 521

## Procedure

All of the procedures for the MVPP study were approved by the institutional review boards at each of the four participating universities and the CDC. Consent and assent forms were sent home with students. At three sites, the investigators gave students a \$5 gift card for returning the forms, regardless of whether or not they participated in the study. In order to reduce attrition rates, telephone follow-up calls and home visits were used.

Data were collected from students and their mothers as part of the baseline assessment in the fall of the 2001 for Cohort 1 and fall of 2002 for Cohort 2, and follow up assessments were

collected for each Cohort in the spring of sixth grade, spring of seventh grade, and spring of eighth grade. Assessments were also collected in the fall of seventh grade for Cohort 2. Students were administered a computer-assisted survey interview (CASI) either in the student's home or another location convenient for the family. The CASI was available in English and Spanish, and students were able to choose the language with which they were most comfortable. At the completion of each interview, students received a \$5 gift card.

Students' mothers were interviewed in a separate room from the student. Due to concerns about a mother's reading ability and inexperience with laptops, research staff read the survey questions aloud to each mother. Surveys were available in English and Spanish, and mothers were able to choose the language with which they were most comfortable. Mothers' interviews took about 43 minutes to complete ( $SD = 13.5$ ), and each mother was compensated \$30 for completing the survey.

## **Measures**

Measures used in the present study assess four domains: maternal depressive symptoms, parenting practices, family functioning, and adolescents' aggression. The internal consistency for the scales was assessed using the sample from Cohort 1 in the fall of 2001.

### **Maternal Depressive Symptoms.**

*The Center for Epidemiologic Studies Depression scale (CES-D)* (Radloff, 1977) was used to assess mothers' level of depression. The CES-D is a 20-item self-report measure that assesses current depressive symptoms, with an emphasis on the affective component (e.g., depressed mood). The frequency of each item is rated on a 4-point scale, ranging from 0 (*Rarely*) to 3 (*Almost all the time*). The range of scores for the CES-D is from 0 to 60 and a higher score indicates a higher level of depression. A score of 16 or higher identifies individuals as exhibiting

a significant level of depressive symptoms (Radloff, 1977; Dojka, Górkiewicz, & Pajak, 2003). The CES-D has been used in epidemiological and clinical studies and has correlated well with other depression scales (Orme, Reis, & Herz, 1986). It has high internal consistency (ranging from .88 to .90), good factorial validity and adequate discriminant validity (Orme et al., 1986). Although depressed mothers were not specifically recruited for this study, nearly 40% met criteria for experiencing a significant level of depressive symptoms (e.g., received a high score of 16 or higher on the CES-D scale).

### **Adolescents' Aggression.**

*The Problem Behavior Frequency Scale (PBFS)* (Farrell, Kung, White, & Valois, 2000) is a 44-item self-report measure that consists of seven scales that assess the frequency of problem behaviors, including aggression (physical, non-physical, and relational), victimization (overt and relational), drug use, and delinquency. For each item, the respondent is asked to indicate how frequently a particular problem behavior has occurred in the past 30 days using a 6-point rating scale ranging from 1 (*Never*) to 6 (*20 or more times*). A higher score on this scale indicates higher levels of problem behavior. In the present study, items from the physical aggression (7 items) and nonphysical aggression (5 items) scales were used to construct a 12-item scale ( $\alpha = .90$ ) similar in content to the measure completed by mothers and teachers. The physical aggression scale includes items, such as, "Been in a fight in which someone was hit" and "Threatened someone with a weapon." The nonphysical aggression scale includes items, such as, "Teased someone to make them angry" and "Picked on someone."

*Behavior Assessment System for Children – Parent Rating Scales for Adolescents (BASC-PRS-A)* (Reynolds & Kamphaus, 1992) is a parent measure of problem behaviors among students that consists of 11 scales. For the current study, the 11-item aggression scale was used.



This scale includes parent-report of the adolescent's tendency to act in a hostile and threatening manner (either verbal or physical). For each item, mothers were asked to rate the adolescent's behavior during the past six months, using a 4-point anchored scale from 0 (*Never*) to 3 (*Almost Always*). The BASC-PRS-A has been normed on a nationally representative sample of 1,090 parents of adolescents (ages 12 to 18) in the U.S. The aggression scale's alpha was .82 and one-month test-retest reliability was .58.

***Behavior Assessment System for Children – Teacher Rating Scales for Adolescents (BASC-TRS-A)*** (Reynolds & Kamphaus, 1992). Teacher ratings were obtained on the aggression scale (14 items) of BASC-TRS-A from one teacher per student. The teacher in the best position to rate each student was identified by each team of teachers. This scale includes the same items and 4-point anchored scale as the parent report form. Three additional items on the teacher report form were not included for this study so that teacher and parent forms were based on the same items. The aggression scale's alpha was .95 and one-month test-retest reliability was .86.

#### **Parenting Practices.**

***The Parenting Practices Scale*** (Gorman-Smith, Tolan, Zelli & Huesmann, 1996). Parenting practices is a self-report measure completed by both mother and adolescent to assess a mother's behavior towards her children during the past 30 days, specifically discipline and monitoring. The scale was adapted from the Chicago Youth Development Study (Gorman-Smith, Tolan, & Henry, 1990), a longitudinal study of African-American and Latino male adolescents living in the inner-city and other urban-poor communities, and the Schools And Families in Education (SAFE) Children study (Gorman-Smith et al., 2007), which targeted inner-city neighborhoods of Hispanic and African American children and families. Both of these studies were originally adapted from the Pittsburgh Youth Study (Loeber, Farrington, Stouthamer-

Loeber, & Van Kammen, 1989), a longitudinal study of African American and Caucasian inner-city boys. The mother's version consists of 42 items and the student's version consists of 33 items. The student's version contained fewer items because the mother's version includes two additional subscales (discipline effectiveness and discipline avoidance).

The present study included the scales from the measure for mothers' and adolescents' reports on the monitoring and involvement scale (12 items, mother  $\alpha = .80$ , student  $\alpha = .80$ ) and mothers' ratings on the discipline effectiveness scale (5 items,  $\alpha = .77$ ). The monitoring and involvement scale assesses a mother's involvement in daily activities and routines and knowledge about a child's whereabouts. The parent's version includes items such as, "How often do you talk to \_\_\_\_\_ about what he/she had actually done during the day?" and "In the past 30 days, how often did you listen to \_\_\_\_\_ when he/she wanted to talk to you?" The discipline effectiveness scale assesses beliefs about the effectiveness of discipline methods and includes items like, "In the past 30 days, how often was the discipline you used effective for your son/daughter?" and "In the past 30 days, if you punished \_\_\_\_\_, how often did his/her behavior get worse?"

### **Family Functioning.**

**Family Relationship Scale** (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996). The Family Relationship Scale measures family relationship characteristics that place adolescents at risk for developing antisocial behavior based on mothers' (38 items) and adolescents' reports (39 items) and was originally developed for use with low-income, urban families. The present study included the cohesion scale (12 items,  $\alpha = .84$ ;  $\alpha = .87$ ) which assesses family communication and closeness and includes items like, "Family members like to spend free time with each other" and "Family members feel very close to each other." Respondents were asked to rate each item on a

scale ranging from 1 (*Not at all true*) to 4 (*Almost always or always true*).

***Reactivity in family communication*** (Henry, Keys, Chertok, & Jegerski, 1990). The reactivity in family communication scale is a 3-item measure that assesses the extent to which parents and children perceive that emotional states experienced by one person in a family spread easily to other family members (mother  $\alpha = .66$ ; student  $\alpha = .58$ ). It includes items, such as, “We interrupt one another when we talk or argue.” Items chosen for the scale were based on items developed by Henry et al. (1990) and used by the Metropolitan Area Child Study (Metropolitan Area Child Study Research Group, 2002). For each item, the respondent was asked use a 4-point rating scale ranging from 0 (*Never*) to 4 (*Almost always*) to indicate the frequency of reactivity in family communication.

### **Demographics.**

***Family Demographics.*** The Family Demographics measure is a parent-report measure that assessed gender of the mother and student, family structure, race, and ethnicity.

### **Analyses**

First, descriptive statistics were calculated to examine the distribution properties of each scale and to detect any outliers. Correlations among the parenting practices and family functioning subscales were also calculated to determine if it was appropriate to create composite measures. Next, correlations between maternal depressive symptoms, parenting practices, family functioning, and adolescents’ aggression were calculated to examine relations within each of the five waves of data.

Autoregressive path models using the Mplus program were used to examine the reciprocal relation between maternal depressive symptoms and adolescents’ aggression. Path models with cross-lagged associations between maternal depressive symptoms and adolescents’

aggression examined the timing of the effects of adolescents' aggression on maternal depressive symptoms and of maternal depressive symptoms on adolescents' aggressive behavior (see Figure 1). Multiple group models for gender were also examined. Unconstrained models that estimated parameters separately for girls and boys were compared to models that constrained specific parameters to the same values for boys and girls. Full information maximum likelihood estimation was used to include all available data under the assumption that missing data were missing at random. Maternal report of maternal depressive symptoms and maternal, teacher, and self-report of adolescents' aggression were included. Each path model controlled for the previous level of each construct and included correlations between constructs within each time point. The fit of each model was evaluated using fit indices (e.g., root mean square error of approximation [RMSEA] and Bayesian information criterion [BIC]). A good fit for the model was considered as follows:  $\chi^2/df < 2.0$ ,  $CFI > .95$ , and  $RMSEA < .08$  (Tabachnick & Fidell, 2001).

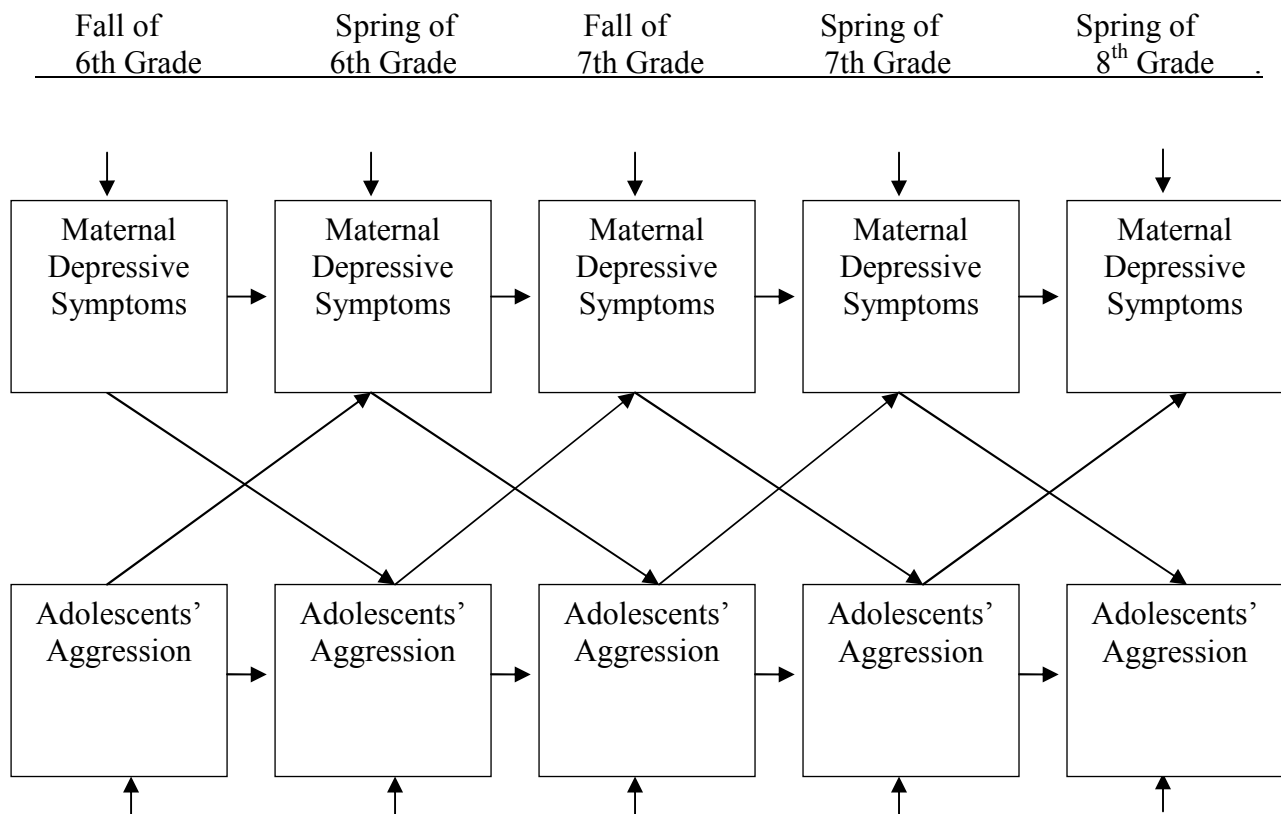


Figure 1. Autoregressive path model examining the reciprocal relation between maternal depressive symptoms and adolescents' aggression. The same model was used for maternal, teacher, and self-report of adolescents' aggression. Correlations between measures within each wave were included in the model, but not shown in the figure.

Findings from the autoregressive path analyses were used to determine the appropriateness of conducting mediational analyses. Tests of the extent to which specific parenting and family processes mediate relations within this model were conducted using autoregressive mediation with longitudinal and concurrent mediation (see Figures 2 and 3). Each path model examined longitudinal mediation effects among maternal depressive symptoms, each mediator, and adolescents' aggression (see paths A<sub>1</sub> and B<sub>1</sub> in Figures 2 and 3 for path of mediation).

Mediation was evaluated using guidelines developed by MacKinnon (2008).

MacKinnon's guidelines are similar to the basic principles of mediation developed by Baron and

Kenny (1986); however, he argues that not all of Baron and Kenny's guidelines are necessary to show mediation is present. According to Baron and Kenny (1986) a significant relation must exist between the independent variable and the dependent variable in order to demonstrate that the independent variable has an effect on the dependent variable. Next, a significant relation must exist between the independent variable and each mediating variable (monitoring and involvement, discipline effectiveness, family cohesion, and reactivity in family communication) (Baron & Kenny, 1986). When the independent variable is controlled for, each mediating variable must be significantly related to the dependent variable. Finally, after controlling for each mediator in the model, Baron and Kenny (1986) argued that the relation between maternal depressive symptoms and adolescents' aggression should not be significant.

MacKinnon (2008) argued that the magnitude and significance of the indirect effects are most critical to the mediation model. He argued that finding a significant relation between an independent variable and dependent variable before the mediators are added to the model or having an insignificant relation between an independent variable and dependent variable after the mediators are added to the model are not essential for displaying mediation. The present study used MacKinnon's guidelines because a body of literature supports MacKinnon's notions that the significance of the relation between an independent and dependent variable are not necessary to show there is mediation (MacKinnon, 2008). The present study does not "give up on a mediation hypothesis when they fail to find an 'effect to be mediated'" (Zhao, Lynch, & Chen, 2010, p. 15). It focused on the magnitude and significance of the indirect effects in the mediation models.

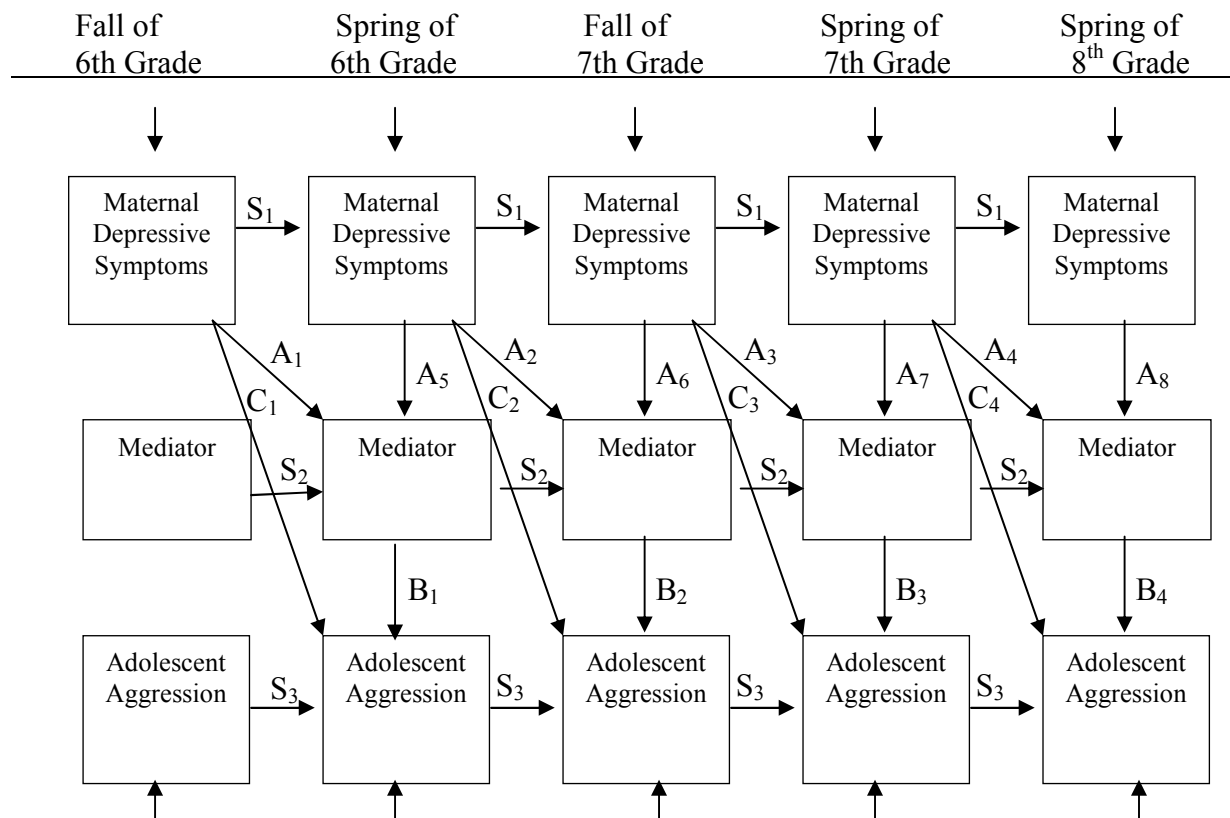


Figure 2. Autoregressive mediation model with longitudinal and contemporaneous mediation. Model depicts maternal depressive symptoms as a cause of adolescents' aggression through parenting practices and/or family functioning (Path A1 and B1).

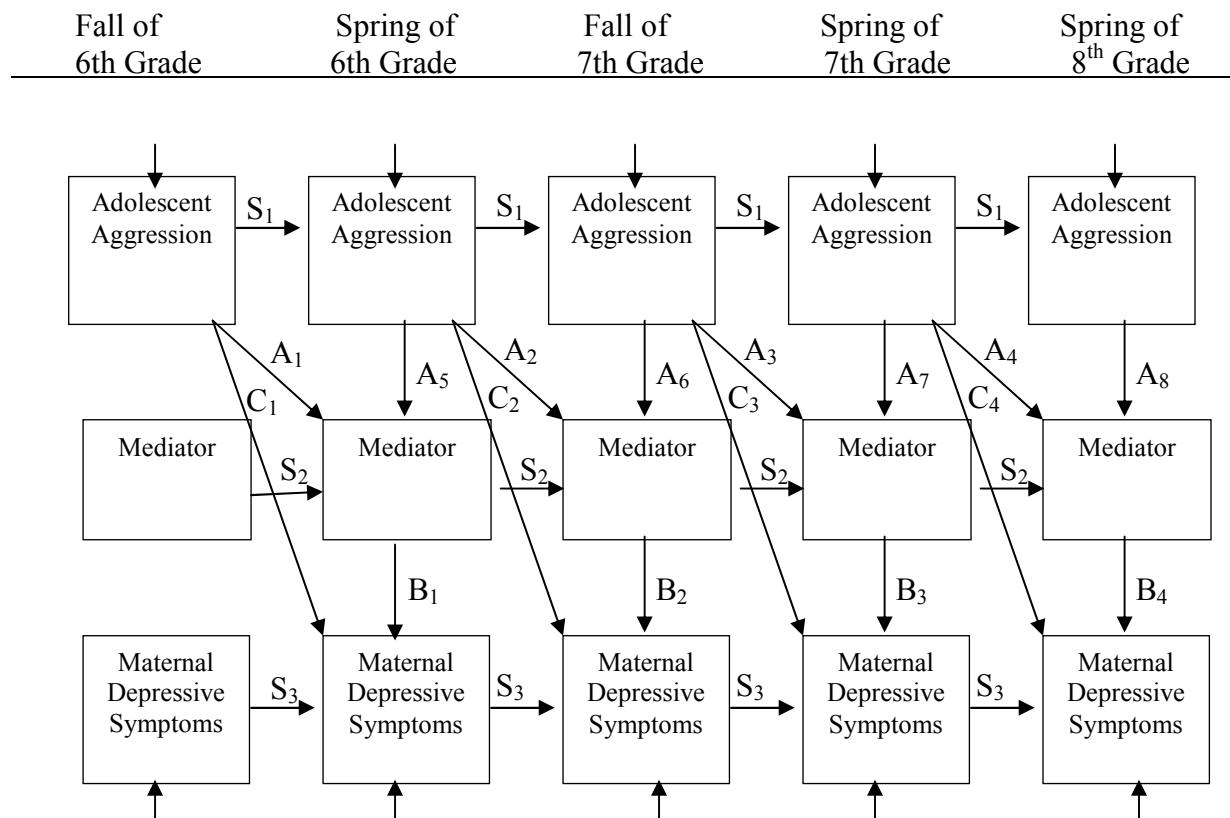


Figure 3. Autoregressive mediation model with longitudinal and contemporaneous mediation. Model depicts adolescents' aggression as a cause of maternal depressive symptoms through parenting practices and/or family functioning (Path A1 and B1).

The models in the present study used path coefficients to examine the extent to which the relation between maternal depressive symptoms and adolescents' aggression (see Figure 2) and the relation between adolescents' aggression and maternal depressive symptoms (see Figure 3) is explained by parenting and family variables. Path coefficients reflect the size of the relation between variables, and indirect effects were estimated by calculating the product of the path coefficients in the "chain of mediation" (MacKinnon, 2008, p. 30). The size of the indirect effect for each mediator variable reflected how 1 unit of change in maternal depressive symptoms affected adolescents' aggression indirectly through each mediating variable (MacKinnon, 2008). The paths were estimated controlling for race, gender, and socioeconomic status, and models used a longitudinal design to examine data collected across 5 waves from the fall of sixth grade



to the spring of eighth grade. Lastly, moderators were examined using multiple group models for gender. Specifically, multiple group models were used to test for gender differences by comparing models in which path coefficients were constrained to be the same values for boys and girls to models in which these parameters were estimated separately within each group.

## **Results**

### **Descriptive Statistics and Preliminary Analyses**

Descriptive statistics were calculated to examine the distribution properties of each scale (see Tables 2 and 3 for means and standard deviations for each scale). Adolescents' aggression was not found to be normally distributed, and this was addressed using log transformed scores. Next, correlations among the parenting practices and family functioning scales were examined to determine whether measures of related constructs or report sources (e.g., parent and adolescent) were sufficiently high to justify creating composite measures (see Table 4). Measures of parenting and family variables had fairly low correlations across sources, ranging from .02 to .29 in absolute value, averaging .13. The absolute value of correlations among different measures of family variables within sources ranged from .01 to .26, with an average of .14. Correlations among mothers' ratings of parenting variables in absolute value were .23. The fairly low correlations among constructs and across sources did not justify creating composite variables across different scales or sources.

Table 2

*Means and Standard Deviations for Maternal Depressive Symptoms and Mothers,' Adolescents,' and Teachers' Reports of Adolescents' Aggression Across 5 Waves of Data.*

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Maternal Depressive Symptoms	14.27	10.48	14.04	9.78	13.31	9.15	13.96	10.61	14.20	10.89
Aggression, Mother Rpt	8.52	5.39	8.26	5.37	7.64	5.19	7.64	5.06	7.30	5.29
Aggression, Student Rpt	1.79	0.83	1.92	0.95	1.76	0.85	1.91	0.95	1.86	0.94
Aggression, Teacher Rpt	16.05	9.48	16.44	9.12	13.10	9.41	14.32	9.25	13.27	9.07

*Note.*  $N = 521$ .

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

Table 3

*Means and Standard Deviations for Parenting and Family Scales for Wave 1*

Scales	Mean	Standard Deviation
<u>Mothers' reports</u>		
Family cohesion	3.22	0.48
Reactivity in family communication	2.87	0.83
Monitoring and involvement	4.31	0.58
Discipline avoidance	1.56	0.77
<u>Adolescents' reports</u>		
Family cohesion	3.05	0.67
Reactivity in family communication	2.00	1.02
Monitoring and involvement	3.76	0.83

*Note.*  $N = 521$ .

Table 4

*Correlations among Parenting and Family Variables for Wave 1*

Scales	1	2	3	4	5	6
<u>Mothers' reports</u>						
1. Family cohesion	-					
2. Reactivity in communication	-0.26***	-				
3. Parent Monitoring	0.46***	-0.16**	-			
4. Discipline	-0.21***	0.21***	-0.23***	-		
<u>Adolescents' reports</u>						
5. Family cohesion	0.13*	-0.15**	0.18***	-0.08	-	
6. Reactivity in communication	0.07	0.13**	-0.02	0.08	-0.01	-
7. Parent Monitoring	0.20***	-0.16**	0.29***	-0.06	0.48***	-0.05

Note.  $N = 521$ .

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Correlations among Variables**

Next, correlational analyses were conducted among mothers', adolescents', and teachers' reports of adolescents' aggression within each of five waves of data (see Table 5). Across all five waves, mothers' and teachers' reports of adolescents' aggression were significantly correlated (average  $r = .25$ ), as were students' and teachers' reports (average  $r = .18$ ) and mothers' and students' reports (average  $r = .20$ ).

Table 5

*Correlations among Mothers', Adolescents', and Teachers' Reports of Adolescents' Aggression within Each Wave*

	Teacher Report with Mothers' reports	Student Report with Teacher's Report	Mothers' reports with Student's Report
Wave 1	0.29**	0.23**	0.20**
Wave 2	0.28**	0.20**	0.25**
Wave 3	0.27**	0.14*	0.18**
Wave 4	0.22**	0.11*	0.24**
Wave 5	0.20**	0.21**	0.12*

Note.  $N = 521$

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

Next, correlational analyses were conducted among maternal depressive symptoms and adolescents' aggression (see Table 6). As hypothesized, there was a positive correlation between maternal depressive symptoms and all reports of adolescents' aggression: teacher report,  $r = .22$ ; adolescents' report,  $r = .13$ ; and maternal report,  $r = .32$ . Mothers' and adolescents' reports on five of the seven parenting and family variables were also significantly correlated with teacher ratings of adolescents' aggression (average  $r = .11$  in absolute value). Six of these variables were significantly correlated with adolescents' reports of their aggression (average  $r = .15$  in absolute value). All seven were significantly correlated with mothers' reports of their adolescents' aggression (average  $r = .27$  in absolute value) (see Table 6).

Table 6

*Correlations of Parenting and Family Variables with Maternal Depressive Symptoms and Teacher, Adolescents' and Mothers' Reports of Adolescents' Aggression for Wave 1*

Variables	Maternal Depressive Symptoms	Teachers' Report of Aggression	Adolescents' Report of Aggression	Mothers' Report of Aggression
<u>Mothers' reports</u>				
Maternal Depressive Symptoms	-	0.22***	0.13**	0.32***
Cohesion	-0.32***	-0.01	-0.10*	-0.25***
Reactivity in Communication	0.28***	0.11*	0.12*	0.33***
Monitoring and Involvement	-0.30***	-0.14**	-0.13**	-0.24***
Discipline Avoidance	0.36***	0.11*	-0.09	0.34***
<u>Students' reports</u>				
Cohesion	-0.11*	-0.09*	-0.15**	-0.14**
Reactivity in Communication	0.07	0.12*	0.21***	0.17**
Monitoring and Involvement	-0.13*	-0.07	-0.16**	-0.13**
<u>Aggression</u>				
Teacher Report	0.22***	-	-	-
Student's Report	0.13**	0.21***	-	-
Mothers' reports	0.32***	0.29***	0.18***	-
Mean	13.96	14.64	1.85	7.87
SD	10.18	9.27	0.90	5.26

Note.  $N = 521$ .

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

Next, correlations were examined between maternal depressive symptoms and adolescents' aggression based on teachers,' adolescents,' and mothers' reports within each wave. As expected, maternal depressive symptoms were positively correlated to reports of adolescents' aggression across all three sources ( $p < .05$ ; see Figure 4). More specifically, maternal depressive symptoms were positively related to mothers' reports of adolescents' aggression at all five waves. A positive relation was also found between maternal depressive symptoms and adolescents' reports of aggression at Waves 1, 2, and 4. Finally, maternal depressive symptoms and teachers' reports of adolescents' aggression were positively correlated in four of the five waves.

A comparison between two independent correlations was then examined to determine if the relation between maternal depressive symptoms and adolescents' aggression varied by gender. Only one of the 15 comparisons was significant ( $p < .05$ ). The relation between maternal depressive symptoms and mothers' reports of adolescents' aggression was higher for girls ( $r = .46$ ) than for boys ( $r = .23$ ) at Wave 2 ( $z = 2.70, p < .001$ ).

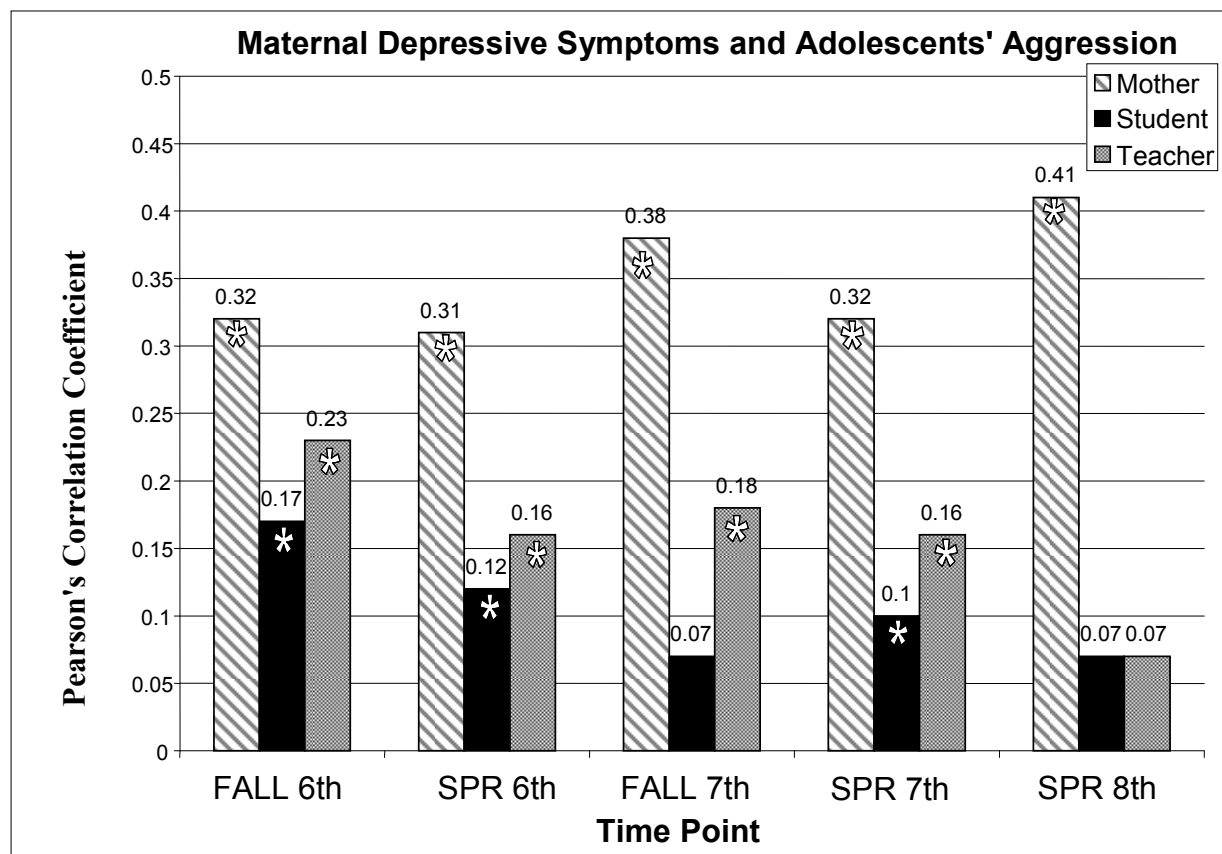


Figure 4. Correlations between maternal depressive symptoms and mothers,' adolescents,' and teachers' reports of adolescents' aggression at each wave.

Note.  $N = 521$ .

\* $p < .05$ .

### Reciprocal Relations between Maternal Depressive Symptoms and Adolescents' Aggression

Path models with cross-lagged associations were examined to test the hypothesis that there is a reciprocal relation between maternal depressive symptoms and adolescents' aggression. Path models examined the relations between maternal depressive symptoms and mothers,' students,' and teachers' reports of adolescents' aggression. Multiple group models for gender were also examined to compare unconstrained models that estimated parameters separately for girls and boys to models constrained to the same values for boys and girls. Fit indices were used to evaluate each model, and model fit was adequate for all models ( $\chi^2/df < 2.0$ , CFI  $> .95$ , and

RMSEA < .08).

Findings showed that effects found in the path models differed somewhat depending on the source of ratings of adolescents' aggression. When measuring adolescents' aggression from their mothers' report, only three of twelve paths linking maternal depressive symptoms and adolescents' aggression were significant in the expected direction (see Figure 5). Maternal depressive symptoms predicted subsequent changes in mothers' reports of adolescents' aggression at only one transition (i.e., Wave 1 to Wave 2), and the magnitude of the effect was small ( $\beta = .11$ ). Similarly, mothers' reports of adolescents' aggression predicted subsequent changes in maternal depressive symptoms from Wave 1 to Wave 2, as well as from Wave 4 to Wave 5. The effect size for each was small in magnitude ( $\beta = .10$  to  $.11$ ). This finding shows that there is a bidirectional impact between maternal depressive symptoms and adolescents' aggression during the transition from the fall of sixth grade to the spring of sixth grade. In addition, mother-reported adolescents' aggression in the spring of seventh grade predicted changes in maternal depressive symptoms in the spring of eighth grade.

When using self-reports to measure adolescents' aggression, only one significant pathway was found in the expected direction. Specifically, self-reported aggression at Wave 2 predicted subsequent changes in maternal depressive symptoms at Wave 3. Finally, no significant pathways were found in a model examining the relation between maternal depressive symptoms and teachers' reports of adolescents' aggression

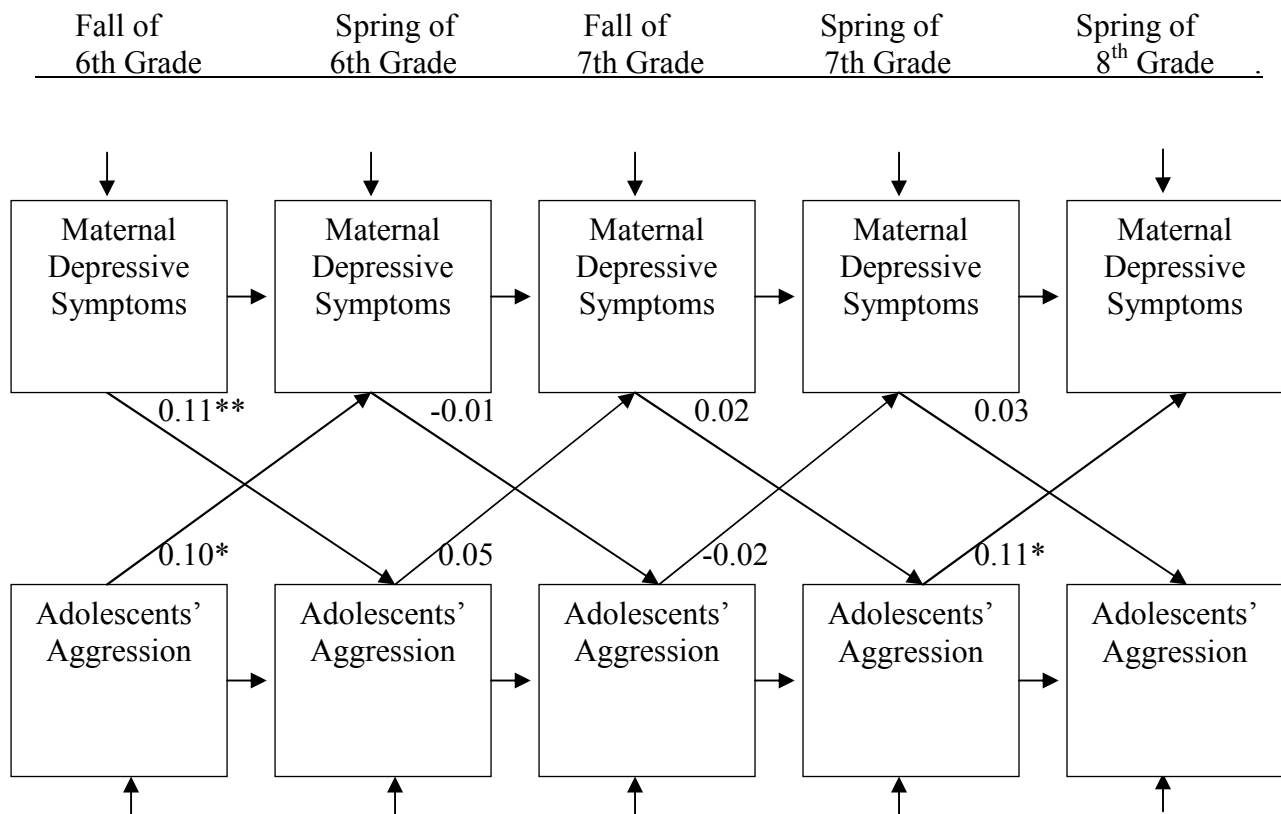


Figure 5. Autoregressive path model examining the reciprocal relation between maternal depressive symptoms and mothers' reports of adolescents' aggression. Correlations between measures within each wave were included in the model, but not shown in the figure.

Note.  $N = 521$ .

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

Next, multiple group growth models of the reciprocal relation between maternal depressive symptoms and adolescents' aggression were examined for girls and boys, starting with unconstrained models. Fully saturated models in which all parameters were estimated independently for boys and girls were compared to models in which corresponding path coefficients were constrained to the same values for boys and girls (see Table 7). Time-specific influences between the observed repeated measures were examined through cross-lagged paths for each of the models to determine how each construct at one time-point influenced changes in the other construct at the next measurement point. The fit of each model was found to be adequate ( $\chi^2/df < 2.0$ ,  $CFI > .95$ , and  $RMSEA < .08$ ).



Table 7

*Model Fit of Constrained Versus Unconstrained Multiple Group Models for Gender for the Reciprocal Relation between Maternal Depressive Symptoms and Adolescents' Aggression*

	$\chi^2$ Value	Degrees of freedom
<u>Relation between Maternal Depressive Symptoms and Mothers' reports of Adolescents' Aggression</u>		
Constrained Model <sup>a</sup>	123.00**	40
Unconstrained Model	76.08**	24
Chi-squared Difference Test	46.92**	16
<u>Relation between Maternal Depressive Symptoms and Student's Report of Adolescents' Aggression</u>		
Constrained Model <sup>a</sup>	132.45**	40
Unconstrained Model	101.66**	24
Chi-squared Difference Test	30.79*	16
<u>Relation between Maternal Depressive Symptoms and Teacher's Report of Adolescents' Aggression</u>		
Constrained Model <sup>a</sup>	87.95**	40
Unconstrained Model	64.54**	24
Chi-squared Difference Test	23.41	16

Note.  $N = 521$ , Girls ( $N = 167$ ), Boys ( $N = 309$ ). <sup>a</sup>These models constrained across gender  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

As expected, the unconstrained model was a better fit for the data examining the relation between maternal depressive symptoms and mothers' reports of adolescents' aggression,  $\chi^2(24, N = 521) = 76.08, p < .001, CFI = 0.97, RMSEA = .10$ , and resulted in an improvement in the BIC relative to the constrained model (22,595 vs. 22,544). These findings indicate that the relation between maternal depressive symptoms and mother-reported aggression varied by gender. Five of twelve paths were significant in the expected direction within a model examining the relation between maternal depressive symptoms and mothers' reports of girls' aggression (see Figure 7). Specifically, maternal depressive symptoms predicted subsequent changes in female adolescents' aggression from Wave 1 to Wave 2 and from Wave 3 to Wave 4. The effect

sizes were moderate ( $\beta$ s = .18 to .28). Female adolescents' aggression predicted subsequent changes in maternal depressive symptoms at three waves (i.e., from Wave 1 to Wave 2, Wave 2 to Wave 3, and Wave 4 to 5; see Figure 7). The magnitudes of the effect sizes were small to moderate in magnitude ( $\beta$ s = .14 to .20).

Consistent with the path model that included the entire sample (see Figure 6), results show a reciprocal relation between maternal depressive symptoms and mothers' reports of female adolescents' aggression from the fall of sixth grade to the spring of sixth grade. The path model shows that maternal depressive symptoms and female adolescents' aggression continue to impact one another in a specific pattern across the five waves of data. As depicted in Figure 6, the pattern of findings alternate between maternal depressive symptoms predicting subsequent changes in levels of mothers' reports of adolescents' aggression (i.e., at Waves 2 and 4) and mothers' reports of adolescents' aggression predicting subsequent changes on maternal depressive symptoms (e.g., at Waves 3 and 5). In contrast, none of these pathways were significant for boys.

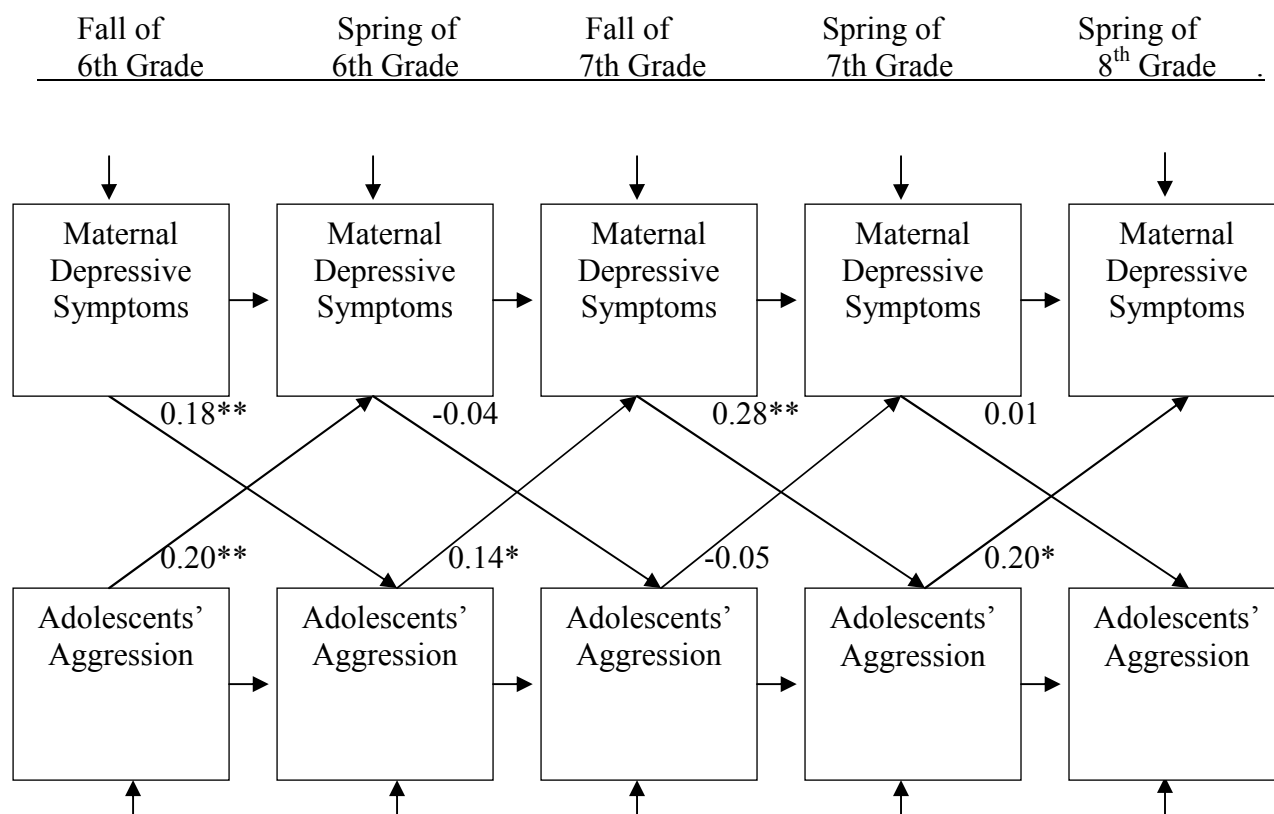


Figure 6. Autoregressive path model examining the reciprocal relation between maternal depressive symptoms and mothers' reports of adolescent females' aggression. Correlations between measures within each wave were included in the model, but not shown in the figure.

Note.  $N = 521$ .

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

The unconstrained model was also a better fit for the model examining the relation between maternal depressive symptoms and adolescents' reports of their own aggression,  $\chi^2(24, N = 521) = 101.66, p < .05, CFI = .94, RMSEA = .11$ , and resulted in an improvement in the BIC relative to the constrained model (18,233 vs. 18,164). This supports the notion that gender plays a role in the relation between maternal depressive symptoms and self-reported aggression. For female adolescents, only one pathway was significant in the expected direction within a model examining the relation among adolescent females, and the effect size was small ( $\beta = .17$ ). Maternal depressive symptoms at Wave 2 predicted self-reported aggression at Wave 3 for

female adolescents. One pathway was significant among male adolescents, but not in the expected direction ( $\beta = .15$ ). Contrary to hypothesis, lower levels of maternal depressive symptoms at Wave 2 predicted higher levels of self-reported aggression at Wave 3. For the data examining the relation between maternal depressive symptoms and teacher-reported aggression, the constrained model was a better fit,  $\chi^2(24, N = 521) = 87.95, p < .001, CFI = .96, RMSEA = .07$ , and resulted in an improvement in the BIC relative to the unconstrained model (28,616 vs. 28,693). In contrast to hypotheses that a reciprocal relation would be found between maternal depressive symptoms and teacher-reported adolescents' aggression, no pathways were significant between maternal depressive symptoms and aggression among adolescent males or females.

**Parenting Practices as Mediator of Maternal Depressive Symptoms as a Predictor of Adolescents' Aggression.** Structural equation modeling was used to determine the extent to which the relation between maternal depressive symptoms and mothers', adolescents', and teachers' reports of adolescents' aggression was mediated by parenting practices. First, the fit of models that incorporated mediated effects was examined and determined to be adequate (see Tables 8 and 9). Table 8 displays fit indices for models examining parenting practices as a mediator of the relation between maternal depressive symptoms and mothers', adolescents', and teachers' reports of adolescents' aggression. Table 9 displays the fit indices for models examining the inverse relation.

Table 8

*Comparison for Models Examining Parenting Practices as a Mediator of the Relation between Maternal Depressive Symptoms and Changes in Adolescents' Aggression*

Adolescents' Aggression (Source)	$\chi^2(57)$	CFI	RMSEA
Mothers' Rating of Discipline Effectiveness as Mediator			
Mother	148.59**	0.96	0.06
Student	174.59**	0.95	0.06
Teacher	146.78**	0.97	0.05
Mothers' Rating of Parental Monitoring as Mediator			
Mother	131.37**	0.97	0.05
Student	174.54**	0.95	0.06
Teacher	131.92**	0.98	0.05
Students' Rating of Parental Monitoring as Mediator			
Mother	190.48**	0.95	0.07
Student	194.31**	0.93	0.06
Teacher	157.13**	0.95	0.06

*Note.*  $N = 521$ .  $\chi^2$  = Chi-square adjusted for maximum likelihood; CFI = comparative fit index; BIC = Bayesian information criterion. RMSEA = root mean square error of approximation; Good model fit is  $\chi^2/df < 2.0$ , CFI  $> .95$ , and RMSEA  $< .08$ .

\* $p < .05$ . \*\* $p < .001$ .

Table 9

*Comparison for Models Examining Parenting Practices as a Mediator of the Relation between Adolescents' Aggression and Changes in Maternal Depressive Symptoms*

Adolescents' Aggression (Source)	$\chi^2(57)$	CFI	RMSEA
Mothers' Rating of Discipline Effectiveness as Mediator			
Mother	177.30**	0.97	0.07
Student	171.38**	0.95	0.06
Teacher	130.60**	0.96	0.05
Mothers' Rating of Parental Monitoring as Mediator			
Mother	136.41**	0.97	0.05
Student	131.40**	0.95	0.06
Teacher	106.18**	0.96	0.04
Students' Rating of Parental Monitoring as Mediator			
Mother	195.05**	0.95	0.07
Student	208.76**	0.93	0.07
Teacher	160.08**	0.95	0.06

*Note.*  $N = 521$ .  $\chi^2$  = Chi-square adjusted for maximum likelihood; CFI = comparative fit index; BIC = Bayesian information criterion. RMSEA = root mean square error of approximation; Good model fit is  $\chi^2/df < 2.0$ , CFI  $> .95$ , and RMSEA  $< .08$ .

\* $p < .05$ . \*\* $p < .001$ .

The first model examined parenting practices (mother- and adolescent-reported parental monitoring and involvement and mother-reported discipline effectiveness) as a mediator of maternal depressive symptoms' prediction of adolescents' aggression. The fit of each model was determined to be adequate, such that the fit indices met the criteria of  $\chi^2/df < 2.0$ , CFI  $> .95$ , and RMSEA  $< .08$  (see Table 8). Findings did not support the hypothesis that parental monitoring and involvement mediated the relation between maternal depressive symptoms and adolescents' aggression. As shown in Table 10, only one significant indirect effect was found for mother-reported monitoring and involvement. Specifically, mothers' reports of monitoring and involvement mediated the relation between maternal depressive symptoms at Wave 3 and mother-reported adolescents' aggression at Wave 4. The effect size was small in magnitude. Mother-reported monitoring and involvement did not mediate the relation between maternal depressive symptoms and teacher- or self-reported aggression at any wave. Similarly, adolescent-reported monitoring and involvement did not mediate the prediction of adolescents' aggression (according to any reporter) by maternal depressive symptoms

Findings partially supported the hypothesis that parental discipline practices would mediate the relation between maternal depressive symptoms as a predictor of adolescents' aggression. Effects for parental discipline practices as a mediator of the relation differed by source, such that significant effects were primarily found for models using mothers' ratings of adolescents' aggression. As shown in Table 10, parental discipline effectiveness mediated the prediction of mother-reported adolescents' aggression at Wave 2, 4, and 5 by maternal depressive symptoms. The mediation by discipline effectiveness accounted for 45% of the total effect of maternal depressive symptoms at Wave 2 on mother-reported adolescents' aggression at Wave 3. Further, the indirect effect of discipline effectiveness accounted for 71% of the total effect at Wave 4 and 80% of the total effect at Wave 5. The magnitude of the indirect effects was

small.

Only one significant indirect effect of parental discipline effectiveness was found for the relation between maternal depressive symptoms and self-reported aggression. Specifically, there was an indirect effect of discipline effectiveness on the relation between maternal depressive symptoms at Wave 1 and self-reported aggression at Wave 2. This indirect effect accounted for 40% the total effect, and the effect size was small. In contrast, discipline effectiveness did not mediate the relation between maternal depressive symptoms and teacher-reported adolescents' aggression at any wave.

Table 10

*Mothers' and Students' Reports of Parenting Practices: Indirect Effects, Direct Effects, and Total Effects for Predictors of Adolescents' Aggression*

	<u>Wave Being Predicted</u>			
	<u>Wave 2</u>	<u>Wave 3</u>	<u>Wave 4</u>	<u>Wave 5</u>
<u>Mothers' Report of Adolescents' Aggression</u>				
Specific Indirect Effects				
Via Monitoring and Involvement (Mother)	0.01	0.01	0.02*	0.00
Via Monitoring and Involvement (Student)	0.00	0.00	0.00	0.00
Via Discipline Effectiveness (Mother)	0.03*	-0.02	0.03*	0.04*
Total Indirect Effect of Parenting Practices	0.03*	-0.02	0.05*	0.04*
Direct Effect of Maternal Depressive Symptoms	0.10*	-0.02	-0.02	-0.01
Total Effect of Maternal Depressive Symptoms	0.12*	-0.04	0.03	0.03
% Indirect/Total Effect	25%	25%	71%	80%
<u>Students' Report of Adolescents' Aggression</u>				
Specific Indirect Effects				
Via Monitoring and Involvement (Mother)	0.01	0.01	0.01	0.00
Via Monitoring and Involvement (Student)	0.00	0.00	0.00	0.00
Via Discipline Effectiveness (Mother)	0.02*	0.01	0.01	-0.01
Total Indirect Effect of Parenting Practices	0.02*	0.02	0.02	-0.01
Direct Effect of Maternal Depressive Symptoms	0.03	-0.09	0.08	-0.04
Total Effect of Maternal Depressive Symptoms	0.05	-0.08	0.09	-0.05
% Indirect/Total Effect	40%	40%	22%	20%

*Note.*  $N = 521$ . Indirect effects for parenting practices as a mediator of the relation between maternal depressive symptoms and teachers' reports of adolescents' aggression are not displayed in the table because there were no significant effects.

\* $p < .05$ , \*\* $p < .001$

Figure 7 represents the full model of parental discipline effectiveness as a mediator of the

relation between maternal depressive symptoms and mother-reported adolescents' aggression. As displayed in Figure 7, maternal depressive symptoms were significantly related to mothers' reports of discipline effectiveness in the expected direction within each wave, including at Wave 2 ( $\beta = -.32, p < .001$ ), Wave 3 ( $\beta = -.51, p < .001$ ), Wave 4 ( $\beta = -.35, p < .001$ ), and Wave 5 ( $\beta = -.48, p < .001$ ). In addition, maternal depressive symptoms predicted subsequent changes in mothers' reports of discipline effectiveness at Wave 2 ( $\beta = -.12, p < .05$ ), Wave 4 ( $\beta = -.14, p < .05$ ), and Wave 5 ( $\beta = -.13, p < .05$ ). Finally, mother-reported discipline effectiveness concurrently related to mother-reported adolescents' aggression at Wave 2 ( $\beta = -.27, p < .001$ ), Wave 3 ( $\beta = -.18, p < .05$ ), Wave 4 ( $\beta = -.23, p < .001$ ), and Wave 5 ( $\beta = -.28, p < .001$ ). The direct relation between maternal depressive symptoms and adolescents' aggression at a subsequent wave was not significant ( $\beta = .00$  to  $.09$ ).

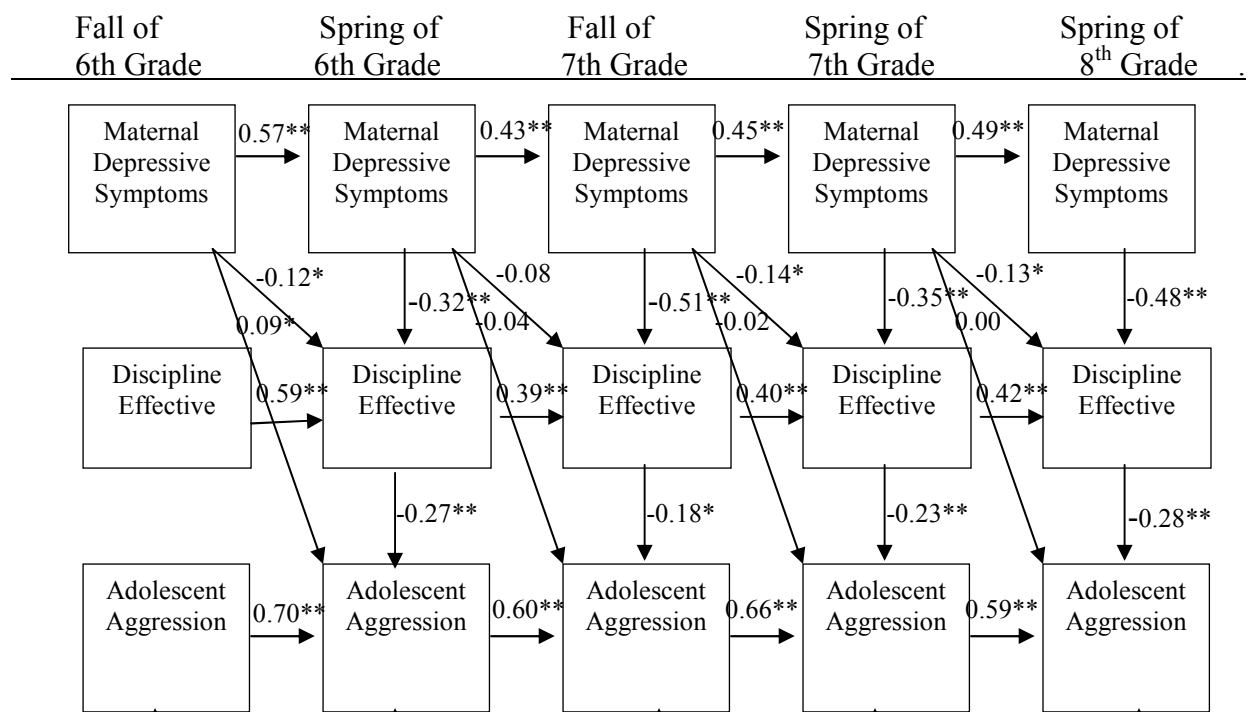


Figure 7. Autoregressive mediation model with longitudinal and contemporaneous mediation. Model depicts maternal depressive symptoms as a cause of mothers' reports of adolescents' aggression through parenting practices.

Note.  $N = 521$ , \* $p < .05$ . \*\* $p < .001$ .



**Parenting Practices as Mediator of Adolescents' Aggression as a Predictor of Maternal Depressive Symptoms.** The second set of models were based on parenting practices mother- and adolescent-reported parental monitoring and involvement and mother-reported discipline effectiveness as mediators of the relation between adolescents' aggression and subsequent maternal depressive symptoms. The fit of models that incorporated mediated effects was examined and determined to be adequate, such that fit indices met the criteria of  $\chi^2/df < 2.0$ , CFI  $> .95$ , and RMSEA  $< .08$  (see Table 9). Findings did not support the hypothesis that parental monitoring and involvement mediated the relation between adolescents' aggression and subsequent maternal depressive symptoms. No significant indirect effects were found for mother- or adolescent-reported monitoring and involvement mediating the relation (see Table 11).

Findings partially supported the hypothesis that parental discipline practices would mediate the relation between adolescents' aggression and subsequent maternal depressive symptoms. Similar to previous path models, the effects for parental discipline practices as a mediator differed by reports of adolescents' aggression, and significant effects were primarily found for models using mothers' ratings of adolescents' aggression. Parental discipline effectiveness mediated the prediction by mother-reported adolescents' aggression of maternal depressive symptoms at Wave 3 and at Wave 5, accounting for 45% and 56% of the total effect, respectively. The magnitudes of the effect sizes were small. In addition, discipline effectiveness mediated the influence of teacher-reported adolescents' aggression at Wave 2 on maternal depressive symptoms at Wave 3. This accounted for 67% of the total effect (see Table 11).

Table 11

*Mothers' and Students' Reports of Parenting Practices: Indirect Effects, Direct Effects, and Total Effect for Predictors of Maternal Depressive Symptoms*

	Wave Being Predicted			
	Wave 2	Wave 3	Wave 4	Wave 5
<u>Mothers' Report of Adolescents' Aggression</u>				
Specific Indirect Effects				
Via Monitoring and Involvement (Mother)	0.00	0.01	0.02	0.01
Via Monitoring and Involvement (Student)	0.00	-0.01	0.01	0.00
Via Discipline Effectiveness (Mother)	0.01	0.04*	0.01	0.05*
Total Indirect Effect of Parenting Practices	0.01	0.04*	0.04	0.05*
Direct Effect of Adolescents' Aggression	0.04	-0.05	-0.03	0.04
Total Effect of Adolescents' Aggression	0.05	-0.01	-0.02	0.09*
% Indirect/Total Effect	20%	45%	67%	56%
<u>Students' Report of Adolescents' Aggression</u>				
Specific Indirect Effects				
Via Monitoring and Involvement (Mother)	0.00	0.01	0.01	0.00
Via Monitoring and Involvement (Student)	0.00	-0.01	0.00	0.01
Via Discipline Effectiveness (Mother)	0.01	0.01	0.00	0.01
Total Indirect Effect of Parenting Practices	0.01	0.02	0.01	0.02
Direct Effect of Adolescents' Aggression	-0.01	0.04	0.01	-0.01
Total Effect of Adolescents' Aggression	0.00	0.05	0.01	0.01
% Indirect/Total Effect	20%	40%	50%	67%
<u>Teachers' Report of Adolescents' Aggression</u>				
Specific Indirect Effects				
Via Monitoring and Involvement (Mother)	0.00	-0.01	0.01	0.00
Via Monitoring and Involvement (Student)	0.00	0.00	0.01	0.00
Via Discipline Effectiveness (Mother)	0.01	0.03*	0.01	0.01
Total Indirect Effect of Parenting Practices	0.01	0.02	0.03	0.01
Direct Effect of Adolescents' Aggression	-0.04	-0.03	-0.04	0.01
Total Effect of Adolescents' Aggression	-0.04	-0.01	-0.01	0.02
% Indirect/Total Effect	20%	67%	43%	50%

Note.  $N = 521$ .

\* $p < .05$ , \*\* $p < .001$

Figure 8 represents the full model of parental discipline practices as a mediator of the relation between mothers' reports of adolescents' aggression and maternal depressive symptoms. As expected, mother-reported adolescent aggression was inversely related to concurrent levels of discipline effectiveness within each wave, including Wave 2 ( $\beta = -.57, p < .001$ ), Wave 3 ( $\beta = -.32, p < .001$ ), Wave 4 ( $\beta = -.23, p < .001$ ), and Wave 5 ( $\beta = -.29, p < .001$ ). There were no significant findings for the effect of adolescents' aggression on subsequent changes in mother–

reported discipline effectiveness ( $\beta = .03$  to  $.05$ ). In terms of mediator effects on maternal depressive symptoms, mother-reported discipline effectiveness was significantly related to subsequent levels of maternal depressive symptoms at Wave 2 ( $\beta = -.32, p < .001$ ), Wave 3 ( $\beta = -.51, p < .05$ ), Wave 4 ( $\beta = -.35, p < .001$ ), and Wave 5 ( $\beta = -.48, p < .001$ ). The direct relation between maternal depressive symptoms and adolescents' aggression at subsequent waves was not significant ( $\beta = .03$  to  $.04$ ).

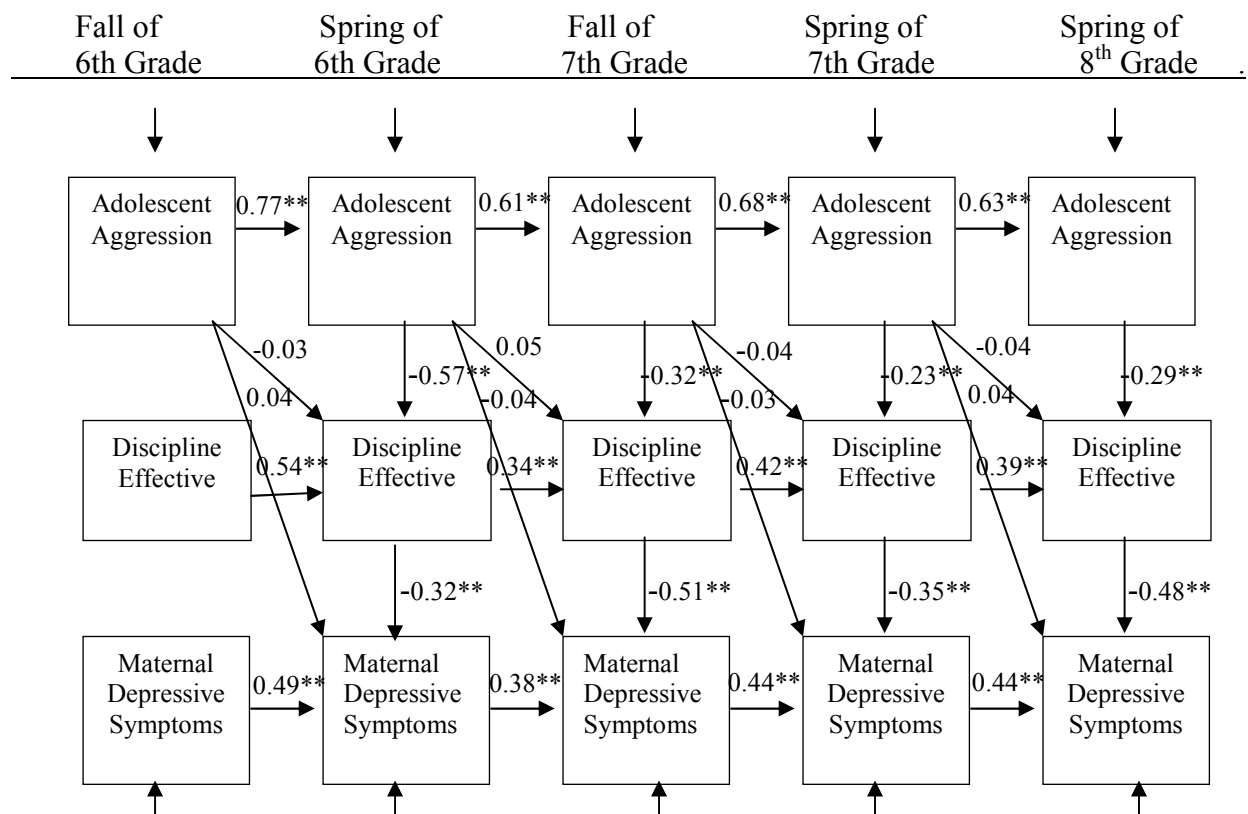


Figure 8. Autoregressive mediation model with longitudinal and contemporaneous mediation. Model depicts mothers' reports of adolescents' aggression as a cause of maternal depressive symptoms through parenting practices

Note.  $N = 521$

\* $p < .05$ , \*\* $p < .001$

In summary, moderate support was found for parental monitoring and involvement as a mediator of the reciprocal relation between maternal depressive symptoms and adolescents aggression. Partial support was found for the hypothesis that parental discipline practices would

mediate the reciprocal relation between maternal depressive symptoms and adolescents' aggression. However, the effect sizes were small in magnitude and findings varied by source, such that significant effects were primarily found in models using mothers' ratings of adolescents' aggression. The autoregressive mediation models (see Figures 7 and 8) displayed that maternal depressive symptoms and adolescents' aggression affect one another indirectly through parental discipline practices in a specific pattern across the five waves of data. Specifically, maternal depressive symptoms indirectly predicted subsequent changes in mother-reported adolescent aggression through parental discipline effectiveness at Waves 2, 4, and 5. In turn, mother-report of adolescent aggression predicted subsequent changes in maternal depressive symptoms indirectly through parental discipline effectiveness at Waves 3 and 5. Furthermore, from the spring of seventh grade to the spring of eighth grade, findings support the reciprocal indirect effects of parental discipline effectiveness as a mediator of maternal depressive symptoms and mother-reported adolescent aggression.

**Family Functioning as Mediator of Maternal Depressive Symptoms as a Predictor of Adolescents' Aggression.** The extent to which the relation between maternal depressive symptoms and subsequent mothers', adolescents', and teachers' reports of adolescents' aggression was mediated by family functioning was examined through structural equation modeling. Model fit was determined to be adequate (see Tables 12 and 13). Table 12 displays the fit indices for models examining family functioning as a mediator of the relation between maternal depressive symptoms and subsequent mothers', adolescents', and teachers' reports of adolescents' aggression. Table 13 displays the fit indices for models examining the inverse relation.

Table 12

*Comparison for Models Examining Family Functioning as a Mediator of the Relation between Maternal Depressive Symptoms and Changes in Adolescents' Aggression*

Adolescents' Aggression (Source)	$\chi^2$ (57)	CFI	RMSEA
Mothers' Rating of Cohesion as Mediator			
Mother	168.77**	0.97	0.06
Student	192.73**	0.94	0.07
Teacher	151.53**	0.96	0.06
Students' Rating of Cohesion as Mediator			
Mother	151.93**	0.96	0.06
Student	171.18**	0.94	0.06
Teacher	134.60**	0.96	0.05
Mothers' Rating of Reactivity in Family Communication as Mediator			
Mother	154.02**	0.96	0.06
Student	173.19**	0.92	0.06
Teacher	136.37**	0.94	0.06
Students' Rating of Reactivity in Family Communication as Mediator			
Mother	157.17**	0.97	0.06
Student	165.36**	0.92	0.06
Teacher	107.05**	0.96	0.04

*Note.*  $N = 521$ .  $\chi^2$  = Chi-square adjusted for maximum likelihood; CFI = comparative fit index; BIC = Bayesian information criterion. RMSEA = root mean square error of approximation; Good model fit is  $\chi^2/df < 2.0$ , CFI  $> .95$ , and RMSEA  $< .08$ . \* $p < .05$ . \*\* $p < .001$ .

Table 13

*Comparison for Models Examining Family Functioning as a Mediator of the Relation between Adolescents' Aggression and Changes in Maternal Depressive Symptoms*

Adolescents' Aggression (Source)	$\chi^2$	CFI	RMSEA
Mothers' Rating of Cohesion as Mediator			
Mother	143.08**	0.96	0.06
Student	170.95**	0.93	0.06
Teacher	130.00**	0.95	0.05
Students' Rating of Cohesion as Mediator			
Mother	145.24**	0.96	0.05
Student	175.36**	0.94	0.06
Teacher	134.88**	0.96	0.05
Mothers' Rating of Reactivity in Family Communication as Mediator			
Mother	152.96**	0.96	0.06
Student	198.25**	0.94	0.06
Teacher	157.75**	0.96	0.06

Table 13 continued

Adolescents' Aggression (Source)	$\chi^2$	CFI	RMSEA
Students' Rating of Reactivity in Family Communication as Mediator			
Mother	137.29**	0.96	0.05
Student	189.23**	0.94	0.07
Teacher	128.11**	0.97	0.05

Note.  $N = 521$ .  $\chi^2$  = Chi-square adjusted for maximum likelihood; CFI = comparative fit index; BIC = Bayesian information criterion. RMSEA = root mean square error of approximation; Good model fit is  $\chi^2/df < 2.0$ ,  $CFI > .95$ , and  $RMSEA < .08$ .

\* $p < .05$ . \*\* $p < .001$ .

Family functioning (i.e., mothers' and adolescents' reports of family cohesion and reactivity in family communication) was examined as a mediator of the relation between maternal depressive symptoms and adolescents' aggression. The fit of each model was determined to be adequate, such that the fit indices met the criteria of  $\chi^2/df < 2.0$ ,  $CFI > .95$ , and  $RMSEA < .08$  (see Table 12). Contrary to hypotheses, no significant effects were found for mothers' or students' reports of family cohesion as mediators of maternal depressive symptoms as a predictor of mothers', students', or teachers' reports of adolescents' aggression. Similarly, no significant effects were found for adolescents' reports of reactivity in family communication as a mediator of the relation between maternal depressive symptoms and subsequent mothers', students', or teachers' reports of adolescents' aggression. In contrast (see Table 14), mothers' reports of reactivity in family communication mediated the relation between maternal depressive symptoms and adolescents' aggression. However, the magnitude of the effect sizes was small, and the results varied by source. No significant effects were found for mothers' reports of reactivity in family communication based on adolescents' or teachers' reports of adolescents' aggression. Mothers' reports of reactivity in family communication mediated the relation between maternal depressive symptoms and mothers' reports of adolescents' aggression. Indirect effects were found from Wave 1 to Wave 2, as well as from Wave 4 to Wave 5. The indirect effect of mothers' reports of reactivity in family communication in mediating the relation between maternal depressive symptoms at Wave 1 and adolescents' aggression at Wave 2

accounted for 9% the total effect. The indirect effect of mothers' reports of reactivity in family communication in mediating the relation between maternal depressive symptoms at Wave 4 and adolescents' aggression at Wave 5 accounted for 43% the total effect. A model of the relation is depicted in Figure 9.

Table 14

*Mothers' and Students' Reports of Family Functioning: Indirect Effects, Direct Effects, and Total Effects for Predictors of Adolescents' Aggression*

	<u>Wave Being Predicted</u>			
	<u>Wave 2</u>	<u>Wave 3</u>	<u>Wave 4</u>	<u>Wave 5</u>
<u>Mothers' Report of Adolescents' Aggression</u>				
Specific Indirect Effects				
Via Family Cohesion (Mother)	0.01	0.00	0.00	0.00
Via Family Cohesion (Student)	0.00	0.00	0.01	0.00
Via Reactivity in Communication (Mother)	0.01	0.01	0.00	0.03*
Via Reactivity in Communication (Student)	0.00	-0.01	0.00	0.00
Total Indirect Effect of Parenting Practices	0.01	0.00	0.00	0.03*
Direct Effect of Maternal Depressive Symptoms	0.10*	-0.03	0.01	0.04
Total Effect of Maternal Depressive Symptoms	0.11*	-0.03	0.01	0.07*
% Indirect/Total Effect	9%	0%	0%	43%

*Note.*  $N = 521$ . Indirect effects for family functioning as a mediator of the relation between maternal depressive symptoms and students' and teachers' reports of adolescents' aggression are not displayed in the table because there were no significant effects.

\* $p < .05$ , \*\* $p < .001$

Figure 9 represents the full model of reactivity in family communication as a mediator of the relation between maternal depressive symptoms and subsequent mother-reported adolescents' aggression. As displayed in Figure 9, maternal depressive symptoms were concurrently related to mother-reported reactivity in family communication in the expected direction within each wave, including at Wave 2 ( $\beta = .12, p < .05$ ), Wave 3 ( $\beta = .18, p < .05$ ), Wave 4 ( $\beta = .23, p < .05$ ), and Wave 5 ( $\beta = .14, p < .05$ ). In addition, maternal depressive symptoms predicted subsequent changes in mother-reported reactivity in family communication at Wave 2 ( $\beta = .16, p < .001$ ), Wave 3 ( $\beta = .12, p < .05$ ), and Wave 5 ( $\beta = .16, p < .001$ ). Furthermore, mothers' report of reactivity in family communication was significantly related to

their concurrent ratings of adolescents' aggression at Wave 2 ( $\beta = .07, p < .05$ ), Wave 3 ( $\beta = .09, p < .05$ ), and Wave 5 ( $\beta = .18, p < .001$ ). The direct relation between maternal depressive symptoms and subsequent changes in adolescents' aggression was only significant from Wave 1 to Wave 2 ( $\beta = .10, p < .05$ ).

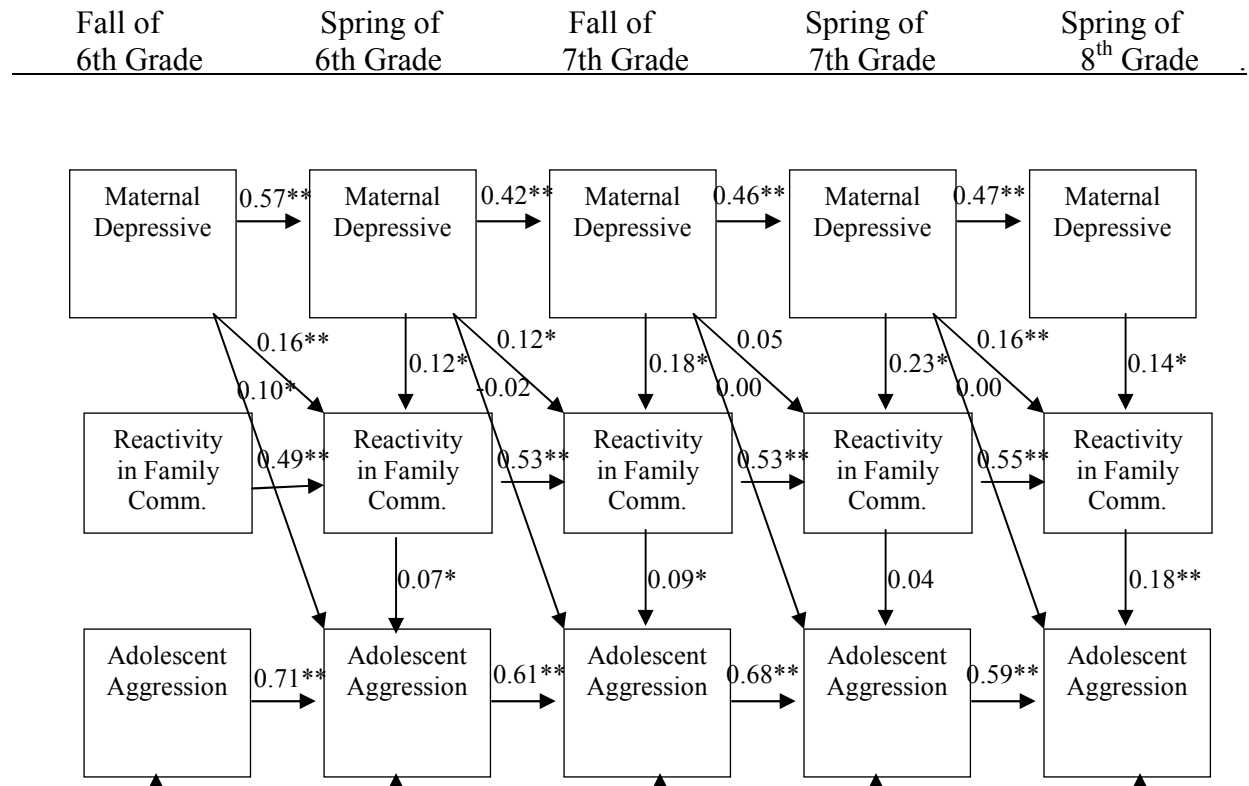


Figure 9. Autoregressive mediation model with longitudinal and contemporaneous mediation. Model depicts maternal depressive symptoms as a cause of mothers' reports of adolescents' aggression through reactivity in family communication

Note.  $N = 521$

\* $p < .05$ , \*\* $p < .001$

**Family Functioning as Mediator of Adolescents' Aggression as a Predictor of Maternal Depressive Symptoms.** The next set of models examined family functioning (i.e., mothers' and students' reports of family cohesion and reactivity in family communication) as a mediator of the relation between adolescents' aggression and subsequent changes in maternal depressive symptoms. The fit of each model was determined to be adequate, such that the fit



indices met the criteria of  $\chi^2/df < 2.0$ ,  $CFI > .95$ , and  $RMSEA < .08$  (see Table 13). No significant indirect effects were found for mothers' or adolescents' reports of family cohesion as mediators. Similarly, no significant indirect effects were found for adolescents' reports of reactivity in family communication as a mediator of the relation. Overall, only one significant indirect effect was found across all models and all sources. Specifically, mothers' reports of reactivity in family communication mediated the relation between mothers' reports of adolescents' aggression at Wave 4 and maternal depressive symptoms at Wave 5, accounting for 50% the total effect (see Table 15). The effect size was small in magnitude.

Table 15

*Mothers' and Students' Reports of Family Functioning: Indirect Effects, Direct Effects, and Total Effects for Mothers' Report of Adolescents' Aggression as a Predictor of Maternal Depressive Symptoms*

	Wave Being Predicted			
	Wave 2	Wave 3	Wave 4	Wave 5
Specific Indirect Effects				
Via Family Cohesion (Mother)	0.01	-0.01	0.01	0.00
Via Family Cohesion (Student)	0.00	-0.01	0.00	0.00
Via Reactivity in Communication (Mother)	0.01	0.02	-0.02	0.03*
Via Reactivity in Communication (Student)	0.02	0.01	0.00	0.02
Total Indirect Effect of Parenting Practices	0.04	0.01	0.01	0.05*
Direct Effect of Adolescents' Aggression	0.08	0.03	-0.03	0.05
Total Effect of Adolescents' Aggression	0.12*	0.04	-0.02	0.10*
% Indirect/Total Effect	33%	25%	33%	50%

*Note.*  $N = 521$ . Indirect effects for family functioning as a mediator of the relation between maternal depressive symptoms and students' and teachers' reports of adolescents' aggression are not displayed in the table because there were no significant effects.

\* $p < .05$ , \*\* $p < .001$

As displayed in Figure 10, mother-reported adolescents' aggression was concurrently related to mothers' reports of reactivity in family communication in the expected direction. Specifically, a positive relation was found within each wave, including at Wave 2 ( $\beta = .12, p < .05$ ), Wave 3 ( $\beta = .11, p < .05$ ), and Wave 5 ( $\beta = .25, p < .001$ ). Significant effects of mothers' reports of adolescents' aggression on changes in mothers' reports of reactivity in family

communication at subsequent time points were found at Wave 2 ( $\beta = .11, p < .05$ ), Wave 3 ( $\beta = .14, p < .05$ ), and Wave 5 ( $\beta = .19, p < .001$ ). Finally, mothers' reports of reactivity in family communication were concurrently related to mothers' reports of adolescents' aggression at Wave 2 ( $\beta = .11, p < .05$ ), Wave 3 ( $\beta = .18, p < .05$ ), Wave 4 ( $\beta = .22, p < .001$ ), and Wave 5 ( $\beta = .13, p < .05$ ). The direct relation between mothers' reports of adolescents' aggression and maternal depressive symptoms at a subsequent wave was significant at Wave 2 ( $\beta = .10, p < .05$ ) (see Figure 10).

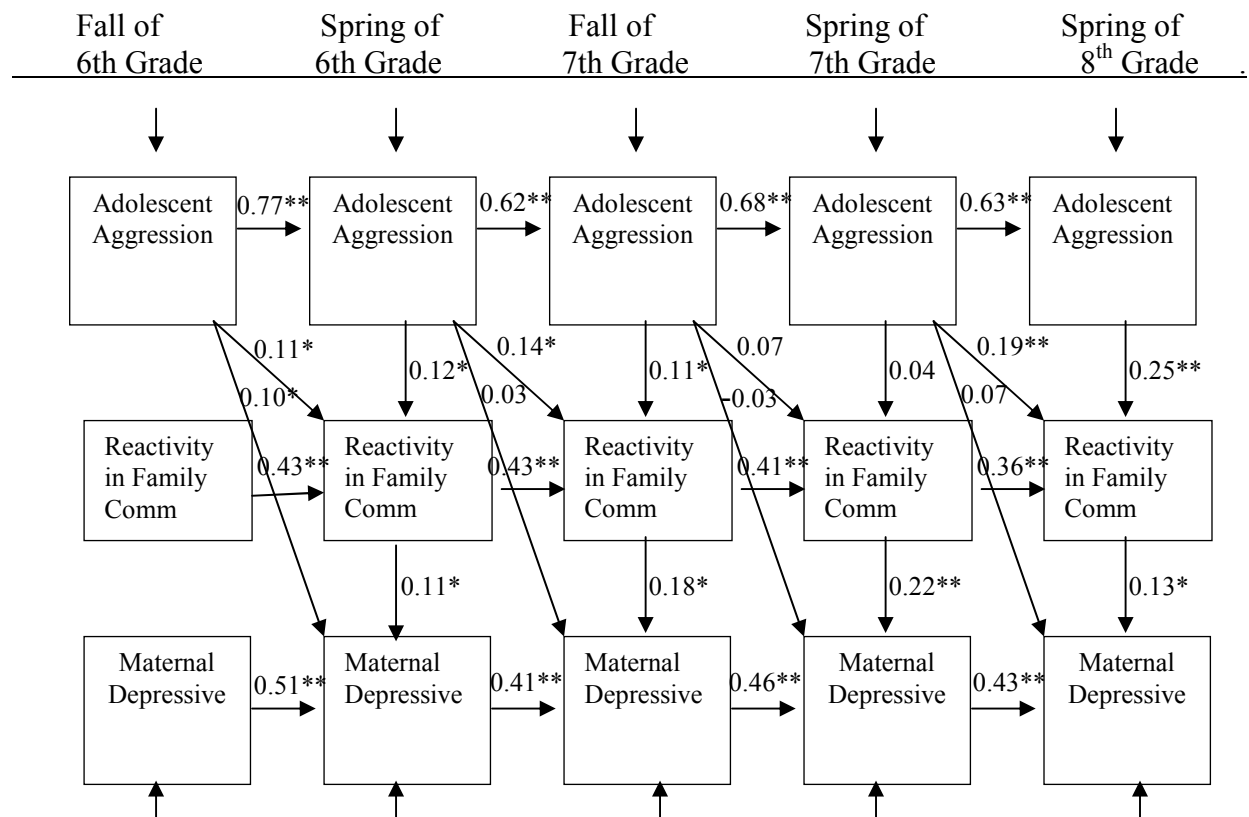


Figure 10. Autoregressive mediation model with longitudinal and contemporaneous mediation. Model depicts mothers' reports of adolescents' aggression as a cause of maternal depressive symptoms through reactivity in family communication

Note.  $N = 521$

\* $p < .05$ , \*\* $p < .001$

In summary, no significant effects were found for mothers' or students' reports of family cohesion as mediators of the relations between maternal depressive symptoms and mothers'

students,' or teachers' reports of adolescents' aggression. In addition, students' reports of reactivity in family communication did not mediate that relation. Partial support was found for the hypothesis that mothers' reports of reactivity in family communication would mediate the relation between maternal depressive symptoms and subsequent levels of adolescents' aggression. However, the magnitude of the effect sizes was small, and the results varied by source (i.e., significant effects were only found when using mothers' ratings of adolescents' aggression). Similar to patterns of results found in the autoregressive cross-lagged models (see Figure 5 and 6) and the autoregressive mediation models for parenting practices (see Figures 7 and 8), a reciprocal relation was found from the spring of seventh grade to the spring of eighth grade. More specifically, from the spring of seventh grade to the spring of eighth grade mothers' reports of adolescents' aggression predicted subsequent changes in levels of maternal depressive symptoms indirectly through reactivity in family communication and, in turn, maternal depressive symptoms predicted subsequent changes in levels of mothers' reports of adolescents' aggression indirectly through reactivity in family communication. In addition to this finding, significant effects were found for mothers' reports of reactivity in family communication as a mediator of the relation between maternal depressive symptoms predicting changes in levels of mothers' reports of adolescents' aggression from Wave 1 to Wave 2 (see Figures 9 and 10).

**Multiple Group Models: Parenting Practices and Family Functioning as Mediator of Maternal Depressive Symptoms as Predictor of Adolescents' Aggression.** Multiple group models separated by gender were used to examine the reciprocal relation between maternal depressive symptoms, adolescents' aggression, and mediators of the relation (parenting practices and family functioning). Fully saturated models in which all parameters were estimated independently for boys and girls were compared to models in which corresponding path

coefficients were constrained to the same values for boys and girls (see Table 16). Time-specific influences between the observed repeated measures were examined through cross-lagged paths for each of the models to determine how each construct at one wave influenced changes in the other construct at the next wave. Fit indices for each model were found to be adequate ( $\chi^2/df < 2.0$ , CFI  $> .95$ , and RMSEA  $< .08$ ).

Chi-squared tests were first used to compare the fit of constrained versus unconstrained multiple group models by gender for the relation between maternal depressive symptoms, parenting practices, and mothers,' students,' and teachers' reports of adolescents' aggression. As shown in Table 16, six of nine chi-squared tests were significant, suggesting that the fit for six of the models was significantly improved by estimating parameters separately by gender. Multiple group models for gender were also examined for the relation between maternal depressive symptoms, family functioning, and mothers,' students,' and teachers' reports of adolescents' aggression (see Table 17). In this case, 8 of 12 chi-squared tests comparing model fit of constrained versus unconstrained multiple group models were significant. This supports that hypothesis that gender moderates the relation between maternal depressive symptoms, parenting practices/family functioning, and adolescents' aggression. Based on these findings, models were examined separately by gender.

Table 16

*Comparison for Multiple Group Models by Gender Examining Constrained Versus Unconstrained Models of the Relation between Maternal Depressive Symptoms, Parenting Practices, and Adolescents' Aggression*

Mediator (Source)	Aggression (Source)	$\chi^2$ (151) Constrained	$\chi^2$ (114) Unconstrained	$\chi^2$ (37) change
Parental Monitoring and Involvement as Mediator				
Mother	Mother	352.69**	230.14**	122.55**
Mother	Student	316.72**	248.51**	68.22**
Mother	Teacher	264.14**	184.45**	79.68**
Student	Mother	352.08**	289.28**	62.81*
Student	Student	316.71**	282.09**	34.62
Student	Teacher	260.46**	221.39**	39.07
Parental Discipline Effectiveness as Mediator				
Mother	Mother	408.16**	331.29**	76.87**
Mother	Student	329.55**	278.24**	51.32
Mother	Teacher	283.30**	228.25**	55.05*

Note.  $N = 521$ , Girls ( $N = 167$ ), Boys ( $N = 309$ ).<sup>a</sup> These models constrained across gender  
\* $p < .05$ . \*\* $p < .001$ .

Table 17

*Comparison for Multiple Group Models by Gender Examining Constrained Versus Unconstrained Models of the Relation between Maternal Depressive Symptoms, Family Functioning, and Adolescents' Aggression*

Mediator (Source)	Aggression (Source)	$\chi^2$ (151) Constrained	$\chi^2$ (114) Unconstrained	$\chi^2$ (37) change
Family Cohesion as Mediator				
Mother	Mother	360.57**	275.83**	84.74**
Mother	Student	319.52**	261.83**	57.69*
Mother	Teacher	257.67**	213.36**	44.30
Student	Mother	312.89**	241.97**	70.92*
Student	Student	285.48**	240.41**	45.06
Student	Teacher	237.19**	197.51**	39.68
Reactivity in Family Communication as Mediator				
Mother	Mother	333.91**	264.23**	69.68*
Mother	Student	314.98**	263.44**	51.54*
Mother	Teacher	255.32**	212.19**	43.13
Student	Mother	343.78**	261.88**	81.90**
Student	Student	310.67**	239.28**	71.39**
Student	Teacher	218.59**	166.55**	52.03*

Note.  $N = 521$ , Girls ( $N = 167$ ), Boys ( $N = 309$ ).<sup>a</sup> These models constrained across gender  
\* $p < .05$ . \*\* $p < .001$ .

The first set of analyses examined multiple group models of parenting practices (mothers' and adolescents' reports of parental monitoring and involvement and mothers' reports of discipline effectiveness). Multiple group models were only examined if the chi-squared test was significant, indicating that fit of the model was significantly improved by estimating parameters by gender. In general, the pattern of findings showed that effects differed depending on the source of ratings of adolescents' aggression. Specifically, significant indirect effects were only found in models that included mother-reported adolescents' aggression and parenting practices, but not with models that included adolescents' or teachers' ratings of adolescents' aggression or parenting practices. More specifically, adolescents' reports of parental monitoring and involvement did not mediate the relation between maternal depressive symptoms and mothers', students', or teachers' reports of adolescents' aggression for boys or girls. Only one significant indirect effect was found for mothers' reports of monitoring and involvement in the girls' model. A significant indirect effect was found between maternal depressive symptoms at Wave 3 on changes mothers' reports of adolescent females' aggression at Wave 4 ( $\beta = .16, p < .001$ ). The indirect effect accounted for 44% of the total effect of maternal depressive symptoms on mothers' ratings of adolescents' aggression. The magnitude of the effect size was small.

Analyses also failed to support a consistent pattern of gender differences in the role of discipline effectiveness as a mediator of the relation between maternal depressive symptoms and adolescents' aggression. Overall, only one significant indirect effect was found in the boys' model, such that mothers' reports of parental discipline effectiveness had a significant indirect effect between maternal depressive symptoms at Wave 4 on subsequent changes in levels of mothers' reports of adolescents' aggression at Wave 5 ( $\beta = .04, p < .05$ ). This accounted for 67% of the total effect of maternal depressive symptoms on mothers' ratings of adolescents'

aggression. Once again, the magnitude of the effect size was small.

Multiple group models of the role of mothers' and students' ratings of family functioning as a mediator of the relation between maternal depressive symptoms and adolescents' aggression also failed to support gender differences. In general, the pattern of findings showed that significant indirect effects were only found in models that included mother-reported adolescents' aggression and family functioning, but not with models that included students' or teachers' ratings. In addition, only two significant indirect effects were found, and those effects were restricted to female adolescents. For example, mothers' reports of reactivity in family communication mediated the relation between maternal depressive symptoms at Wave 4 and mothers' reports of adolescents' aggression at Wave 5 ( $\beta = .04, p < .05$ ), accounting for 77% of the total effect. In addition, mothers' reports of family cohesion had a significant indirect effect between maternal depressive symptoms at Wave 1 on mothers' reports of adolescents' aggression at Wave 2 ( $\beta = .05, p < .05$ ), accounting for 28% of the total effect of maternal depressive symptoms on mothers' ratings of adolescents' aggression. Both of the effect sizes were small in magnitude.

**Multiple Group Models: Parenting Practices and Family Functioning as Mediator of Adolescents' Aggression as a Predictor of Maternal Depressive Symptoms.** Multiple group models for gender were also examined for the relation between mothers', students', and teachers' reports of adolescents' aggression, parenting practices, and subsequent maternal depressive symptoms. Chi-squared tests were used to compare the model fit of constrained versus unconstrained multiple group models by gender. As is displayed in Table 18, five of the nine chi-squared tests were significant, suggesting that the fit for five of the models was significantly improved by estimating parameters separately by gender. Multiple group models for

gender were also examined for the relation between mothers,' students,' and teachers' reports of adolescents' aggression, family functioning, and maternal depressive symptoms (see Table 19). Seven of twelve chi-squared tests were significant, highlighting that multiple group models by gender better represented the data for most of the models. Based on these findings, models were examined separately by gender. Multiple group models were only run for models that were significantly improved by estimating parameters by gender.

Table 18

*Comparison for Multiple Group Models by Gender Examining Constrained Versus Unconstrained Models of the Relation between Adolescents' Aggression, Parenting Practices, and Maternal Depressive Symptoms*

Mediator (Source)	Aggression (Source)	$\chi^2$ (151) Constrained	$\chi^2$ (114) Unconstrained	$\chi^2$ (37) change
Parental Monitoring and Involvement as Mediator				
Mother	Mother	332.39**	230.14**	102.26**
Mother	Student	320.61**	248.51**	72.11**
Mother	Teacher	280.61**	184.45**	96.16**
Student	Mother	345.82**	289.95**	55.87*
Student	Student	304.94**	259.75**	45.19
Student	Teacher	263.48**	214.24**	49.24
Parental Discipline Effectiveness as Mediator				
Mother	Mother	365.82**	305.83**	60.00*
Mother	Student	320.86**	278.24**	42.61
Mother	Teacher	290.41**	252.54**	37.87

Note.  $N = 521$ , Girls ( $N = 167$ ), Boys ( $N = 309$ ). <sup>a</sup> These models constrained across gender  
\* $p < .05$ . \*\* $p < .001$ .



Table 19

*Comparison for Multiple Group Models by Gender Examining Constrained Versus Unconstrained Models of the Relation between Adolescents' Aggression, Family Functioning, and Maternal Depressive Symptoms*

Mediator (Source)	Aggression (Source)	$\chi^2$ (151) Constrained	$\chi^2$ (114) Unconstrained	$\chi^2$ (37) change
Family Cohesion as Mediator				
Mother	Mother	321.20**	259.77**	61.44*
Mother	Student	294.65**	244.33**	50.32
Mother	Teacher	243.45**	197.23**	46.22
Mother	Mother	293.44**	244.43**	49.00
Mother	Student	278.15**	243.10**	35.05
Mother	Teacher	239.69**	198.66**	41.03
Reactivity in Family Communication as Mediator				
Mother	Mother	331.40**	263.35**	68.05**
Mother	Student	335.92**	275.07**	60.85*
Mother	Teacher	286.94**	230.33**	56.61*
Mother	Mother	325.39**	250.23**	75.17**
Mother	Student	319.51**	255.93**	63.58*
Mother	Teacher	246.78**	188.75**	58.03*

*Note.*  $N = 521$ , Girls ( $N = 167$ ), Boys ( $N = 309$ ). <sup>a</sup> These models constrained across gender  
\* $p < .05$ . \*\* $p < .001$ .

The first set of analyses examined multiple group models of parenting practices (mothers' and adolescents' reports of parental monitoring and involvement and mothers' reports of discipline effectiveness). The second set of analyses examined multiple group models of mothers' reports of family functioning (reactivity in family communication and family cohesion) as a mediator of the relation between maternal depressive symptoms and subsequent adolescents' aggression. Analyses failed to support a pattern of gender differences in the role of parenting practices or family functioning as a mediator of the relation between maternal depressive symptoms and adolescents' aggression. No indirect effects were found for the models examined separately for male and female adolescents.

## Discussion

The purpose of this study was to examine the reciprocal relation between maternal depressive symptoms and adolescents' aggression, and to investigate mediators that past research (e.g. Barry et al., 2009; Timko et al., 2002) suggests account for this relation (parenting practices and family functioning). It was first hypothesized that a positive relation would be found between maternal depressive symptoms and adolescents' aggression within each time point. Consistent with previous studies (e.g., Jaffee & Poulton, 2006; Pilowsky et al., 2006; Sanders & McFarland, 2000), this study found that maternal depressive symptoms were concurrently associated with higher levels of teachers, adolescents,' and mothers' reports of adolescents' aggression within each time point. This finding adds to the literature in several ways. First, it adds to a growing body of literature about the concurrent relation between maternal depressive symptoms and adolescents' aggression (e.g., Jaffee & Poulton, 2006). It also suggests that maternal depressive symptoms not only impact internalizing symptoms (e.g., Robila & Krishnakumar, 2006), but also impact aggressive behaviors among adolescents. In addition, in contrast to previous studies that have primarily focused on examining the presence or absence of maternal depression (e.g., Breslau, Davis, & Prabucki, 1988), the current study examined maternal depressive symptoms as a quantitative variable. Furthermore, findings in the present study are consistent with previous studies that have used less diverse samples (e.g., Marmorstein & Iacono, 2004). The present study supports the notion that the concurrent relation between maternal depressive symptoms and adolescents' aggression exists within a more diverse sample of minority families.

This study also examined the extent to which the relation between maternal depressive symptoms and adolescents' aggression was reciprocal. According to theory and empirical

research, maternal depressive symptoms and adolescents' aggression can impact one another in a bidirectional interaction through mechanisms of shaping, behavioral activation, and family systems (e.g., Bell, 1977; Corsini & Wedding, 2000; Sameroff, 1975). Based on this previous work, it was hypothesized that a reciprocal relation would be found, such that maternal depressive symptoms would predict subsequent changes in adolescents' aggression and adolescents' aggression would, in turn, predict subsequent changes in maternal depressive symptoms. Contrary to this hypothesis, only a few pathways were significant for levels of maternal depressive symptoms predicting subsequent changes in adolescents' aggression and levels of adolescents' aggression predicting maternal depressive symptoms.

One possible explanation for the lack of findings is that the predominantly African American sample that was used in the present study differs from the predominantly Caucasian or mixed ethnicity samples used in past studies that supported this relation (e.g., Ge et al., 1995; Gross et al., 2008, 2009; Jaffee & Poulton, 2006). Researchers have argued that African American women manifest and cope with depressive symptoms differently than women in other ethnic and racial groups, and this could help to explain the lack of findings in the present study. Waite and Killian (2007, 2009) examined African American women's conceptualization of depression within their socio-cultural context and found that African American women often focus on the physical symptoms associated depression (e.g., physical weakness, fatigue, and exhaustion) and describe their depressive symptoms using atypical terms like, "crazy, being in a black hole, the devil, fatigued, irritable, losing control, pain, lonely, anger, exhaustion, stressed, out of balance, drowning, and sick" (Waite & Killian, 2007, p. 165). Therefore, the way that African American women conceptualize and describe their depressive symptoms may differ from how depression is traditionally described (e.g., feeling sad). Perhaps the depressive

symptoms exhibited by mothers in the sample in the present study were not salient enough to have a significant impact on adolescents' behaviors. Alternatively, the symptoms that minority mothers present with may not be associated with aggressive behaviors among youth.

Another possible explanation is that African American women are socialized to appear to be strong, independent, and capable of handling life's stressors (e.g., Amankwaa, 2003; Brown & Lumley, 2000), and may therefore minimize depressive symptoms. This makes it difficult to detect if they are suffering from depression. As one African American woman described, "Depression is not anything we talk about, and we do not admit we are depressed. Black women have always had to deal with a lot, and we are expected to keep on without complaining" (Waite & Killian, 2007, p. 165). Perhaps having a predominantly minority sample in the present study contributed to the lack of findings because mothers in the present study did not exhibit or portray maternal depressive symptoms in the same manner as mothers in the predominantly Caucasian samples in previous studies; therefore, it could have a different impact on adolescents' aggression. Future studies may need to explore how race, ethnicity, and socioeconomic status may play a role in the reciprocal relation between maternal depressive symptoms and adolescents' aggression.

Another explanation for why findings in the present study may differ from findings in previous studies is that previous studies that support the notion that a reciprocal relation exists over time between maternal depressive symptoms and adolescents' aggression used different measurement methods. More specifically, previous studies have assessed aggression using observations of aggressive behaviors at one time point in a single year (Gross et al., 2008, 2009). Observational assessments used in previous studies (Coyne et al., 1987; Gross et al., 2008, 2009) may not be representative of a child's behavior because of the infrequency of the observations

and observational assessments can inherently be confounded by situational variables (e.g., timing or setting of the observation of behaviors, and reactivity effects). The present study, which included measures of adolescents' aggression using reliable assessments completed by three informants, may provide a more accurate representation of adolescents' aggressive behaviors across a range of situations. Previous studies have also used more global measures of adolescents' psychological functioning and maladaptive behaviors instead of focusing on specific behaviors like aggression or depression (e.g., Ge et al., 1995). By not making this distinction, it is difficult to parse out what aspects of maternal behaviors and functioning and what aspects of adolescents' behaviors and functioning impact one another.

Another reason for the difference in findings between previous studies and the present study are the samples. The present study included both male and female adolescents and examined data across five time points from sixth grade to eighth grade. Previous studies (Gross et al., 2008, 2009) used samples that included only boys and examined the relation across a longer span of time from infancy through adolescence. While there is ample theoretical support for there being a reciprocal relation between maternal depressive symptoms and aggression among younger children (e.g., Bandura, 1977; Sameroff, 1975), few empirical studies have been conducted with adolescents. The findings of the present study may suggest that maternal depressive symptoms and adolescents' aggressive behaviors do not reciprocally predict one another across the duration of middle school. Perhaps the lack of findings in the present study is due to the result of the limited time span examined in the present study. Future studies may want to try to replicate previous studies (e.g., Gross et al., 2009) by examining the relation between maternal depressive symptoms and youth aggression from infancy through adolescence. This

could help to determine when the reciprocal effects exist in the relation between maternal depressive symptoms and youth aggression

Despite the hypotheses not being fully supported, it is important to acknowledge that there was a pattern among these findings that were significant. First, effects found in the models differed by source, such that a greater number of pathways were significant when using the same reporter (e.g., mothers' reports of maternal depressive symptoms and mothers' reports of adolescents' aggression). This finding is consistent with previous research using multiple informants' ratings of adolescents' aggression (e.g., Hartos & Power, 2000). The discrepancy of findings across sources could be the result of source variance, such that a mother's perceptions could influence her ratings of all variables in the model. Alternatively, the discrepancy could be attributed to the different settings (e.g., school versus home) in which mothers and teachers are observing adolescents' aggressive behaviors. While this highlights the importance of using multiple reporters of constructs, it, unfortunately, is difficult to determine the most appropriate way to interpret discrepancies across reporters.

A second pattern in the significant findings was related to the timing of the findings. A bidirectional relation between maternal depressive symptoms and mothers' reports of adolescents' aggression was found during the transition from the fall of sixth grade to the spring of sixth grade. This suggests that mothers and adolescents affect one another in a reciprocal manner during the first year of middle school. This finding is consistent with Bronfenbrenner's (1979) ecological theory. Bronfenbrenner (1979) argued that factors within a home environment, including a positive and secure parent-child relationship, can play a key role in a child adapting to transitions into new settings (e.g., from elementary school to middle school). If a parent is unable to provide a child with parental support, a secure parent-child relationship, or positive

parent-child interactions, a child is at risk for maladjustment during transitions. Research shows that depressed mothers, as compared to nondepressed mothers, are more negative, critical, unresponsive, and unsupportive towards their children (Frye & Garber, 2005; Lovejoy et al., 2000), and this can have a negative impact on the parent-child relationship. According to Bronfenbrenner (1979), this could have a negative impact on a child's ability to make a healthy transition into a new school and lead to maladaptive outcomes (e.g., aggressive behaviors). As research has shown, an adolescent's aggressive behaviors can, in turn, exacerbate a mother's psychological distress (e.g., depressive symptoms) (Cui et al., 2007; Leve et al., 2001).

It was also hypothesized that gender would moderate the relation between maternal depressive symptoms and adolescents' aggression. Based on previous studies (e.g., Brookmeyer et al., 2005; Dornfield & Kruttschnitt, 1992), it was proposed that the relation between maternal depressive symptoms and adolescents' aggression would differ by gender, such that the relationship would be stronger among male adolescents. Findings partially supported the first part of the hypothesis, such that the relation was found to vary by gender. However, in contrast to what was hypothesized, the relation was stronger among female adolescents. More specifically, results indicated that among adolescent girls, higher levels of maternal depressive symptoms predicted higher levels of mothers' and students' reports of adolescents' aggression, and higher levels of mothers' and students' reports of adolescents' aggression predicted higher levels of maternal depressive symptoms. These effects were not significant among boys. In contrast, among boys, higher levels of maternal depressive symptoms predicted lower levels of students' reports of adolescent boys' aggression. Similar effects were not found for mothers' or teachers' reports of adolescent boys' aggression.

Past research has displayed mixed findings regarding whether or not gender influences

the relation between adolescents' aggressive behaviors and maternal functioning (e.g., Erel & Burman, 1995; Rothbaum & Weisz, 1994). Findings in the present study are consistent with a body of literature suggesting that there are gender differences in the relation between maternal depressive symptoms and youth aggressive behaviors (e.g., Brookmeyer et al., 2005; Dornfield & Kruttschnitt, 1992). There are several theories and reasons for why gender may play a role, such that gender can be "a dynamic cultural construct" that can be influenced by a number of biological, psychological, and social variables (Hamilton & Russo, 2006, p. 508). From a biological perspective, mothers are more likely to genetically transmit depression to their daughters and perhaps the adolescent girls in the present study are exhibiting aggressive symptoms associated with depression (e.g., irritability) (Hamilton & Russo, 2006). Hence, the influence of maternal depressive symptoms on adolescents' aggression would be stronger among girls. Another explanation is that societal norms about how male and female adolescents should behave impact how youth aggression impacts mothers. Physical aggression is largely considered by society to be a behavior exhibited by males, such that, "violence is overwhelmingly the domain of young men" (Cunningham, 2000, p. 2). Therefore, an adolescent female displaying aggressive behavior is more contrary to societal norms and expectations and this could have more of an impact on a mother's well-being. For example, it could be more distressing for a mother to see her daughter being physically aggressive because this contrasts with what is viewed by society as normative behavior. The finding that the reciprocal relation between maternal depressive symptoms and adolescents' aggression was stronger among girls was supported in one previous study. Jaffee and Poulton (2006) examined the reciprocal relation between maternal depressive and anxiety symptoms and youth antisocial behaviors within a predominantly Caucasian sample of children and adolescents and their families. The authors



found a stronger relation among girls (Jaffee & Poulton, 2006).

It was also hypothesized that parenting practices (parental monitoring and involvement and parental discipline practices) would mediate the relation between maternal depressive symptoms and adolescents' aggression. For each model, gender was purported to moderate the relation. Similar to the pattern of results found in the autoregressive cross-lagged path models, the overall pattern of findings varied depending on the source of ratings. Specifically, significant effects were primarily found in models using mothers' ratings of the constructs in the model. The overall pattern of findings also differed across specific aspects of parenting practices, such that partial support was found for the hypothesis that parental discipline practices mediated these relations, but not for parental monitoring and involvement. Specifically, parental discipline practices mediated the relation of maternal depressive symptoms as a predictor of mothers' and students' reports of adolescents' aggression across three waves. Parental discipline practices also mediated the relation of mothers' and teachers' reports of adolescents' aggression as a predictor of maternal depressive symptoms at one wave. Consistent with previous studies (e.g., Barry et al., 2009) and theoretical underpinnings (e.g., interpersonal perspective, family stress theory, and learning theory), findings of the present study show that parental discipline effectiveness partially mediated the relation. For example, one study found that discipline practices partially mediated the relation between maternal depressive symptoms and preadolescent and adolescent boys' aggression (Barry et al., 2009) and another study found that discipline effectiveness mediated this relation in a cross-sectional design (Pugh & Farrell, 2011).

Gender was found to moderate the relation between maternal depressive symptoms, parental discipline effectiveness, and adolescents' aggression, such that the best fit of the models were multiple group models separated by gender. Despite the models being a better fit, only one

significant indirect effect was found among female adolescents for parental discipline effectiveness as a mediator of the relation between maternal depressive symptoms as a predictor of mothers' reports of adolescents' aggression. No significant indirect effects were found in the adolescent boys' model. In addition, no indirect effects were found for parental discipline effectiveness as a mediator of the relation of adolescents' aggression as a predictor of maternal depressive symptoms. Perhaps the lack of findings in the multiple group models is attributable to the power in the analyses. More specifically, the present study conducted complex mediational analyses, and when models were separated by gender the sample sizes decreased substantially (female adolescents  $N = 167$ ). Another possible explanation is that gender differences that were found in relation between maternal depressive symptoms and adolescents' aggression are not present in full models that include mediators. This means that gender does not moderate the relation between maternal depressive symptoms, parenting practices, and adolescents' aggression.

Findings did not support the hypothesis that parental monitoring and involvement would mediate the relation between maternal depressive symptoms and adolescents' aggression. In addition, although multiple group models separated by gender were found to improve the fit of the model, support was not found for the hypothesis that parental monitoring and involvement would mediate the relation for boys or girls. This finding that neither mothers' or students' reports of monitoring and involvement mediated the relation is contrary to findings of several studies (e.g., Dumas & Wekerle, 1995; Miller et al., 1993; Strassberg et al., 1994). There are a few plausible explanations for the lack of findings in the present study. One explanation is that parental monitoring and involvement plays a less significant role during adolescence.

Adolescence marks a time period when youth strive for more autonomy and gain increased

decision-making and freedoms (Eisenberg et al., 2005; Obsuth et al., 2006; Spear, 2000).

Parental monitoring and involvement may become less important in the parent-child relationship because of this shift during adolescence. However, other parenting practices, such as parent discipline effectiveness, will continue to be an important aspect of the parent-child relationship.

A second explanation for the lack of findings is that parental monitoring and involvement may not mediate the relation for the sample in the present study, which consisted of a predominantly minority sample of adolescents and their families from a range of socioeconomic backgrounds. Past studies have often examined parental monitoring and involvement as a mediator of this relation using a predominantly Caucasian middle to upper class sample of families (e.g., Dumas & Wekerle, 1995; Pettit et al., 2001; Simons-Morton et al., 2008).

Researchers have claimed that race and ethnicity play a role in parenting and family practices, such that African American and Caucasian American families operate differently (Garcia, Meyer & Brillon; Gray & Steinberg, 1999). Researchers have also argued that cultural meanings for parenting practices may vary across ethnic groups. Culture is believed to influence how parents relate to and interact with their children and how children perceive and interpret their parents' behaviors. In addition, different ethnic groups face unique opportunities and challenges that impact the parenting and family factors that lead to aggressive outcomes among youth. It has therefore been proposed that parenting and family behaviors must be considered within the context of ethnicity and culture in order to develop a nuanced understanding of the relation between parenting practices and aggression among youth (Chao, 1994; Deater-Deckard et al., 1996; Harkness & Super, 1995; Ho, Bluestein, & Jenkins, 2008). Researchers have argued that African American and Hispanic families place a high value on kinship and often have access to a large social support group and extended family supports (Pachter, Auinger, Palmer, &

Weitzman, 2006). Therefore, even if maternal depressive symptoms impact a mother's monitoring and involvement practices, there could be extended family members or other social supports to implement appropriate monitoring and involvement practices. In addition, more than half of the mothers in the present study reported being married to the father of their child or living with a stepfather. Perhaps fathers or stepfathers in the present study provided parental monitoring and involvement practices and this explains why parental monitoring and involvement was not found to mediate the relation in the present study (Pachter, et al., 2006).

Empirical research has supported the notion that race and ethnicity play a role in the implementation and effectiveness of parenting practices. One study found that a parent's use of physical discipline predicted higher levels of externalizing behaviors among Caucasian American adolescents, but lower levels of externalizing behaviors among African American adolescents (Lansford et al., 2004). This finding is consistent with previous research findings that physical discipline was linked to higher externalizing behaviors among Caucasian American children, but not among African American children (Deater-Deckard et al., 1996). In addition, Walker-Barnes and Mason (2001) found a significant interaction between parenting and ethnic and cultural heritage among an ethnically diverse sample of adolescents. More specifically, the influence of parenting (higher levels of behavioral control and lower levels of lax parental control) on an increased risk for gang involvement and delinquency was higher among African American students, as compared to Hispanic and Caucasian students (Walker-Barnes & Mason, 2001). Perhaps alternate variables that were not examined in the present study could better account for the relation between maternal depressive symptoms and adolescents' aggression for the sample in the present study.

Another possible explanation for parental monitoring and involvement not being found to mediate the relation in the present study is how maternal depression is associated with parental monitoring and involvement. The presentation of depression can vary across individuals, such that two individuals could exhibit different symptoms and both be diagnosed with depression. Therefore, depending on the specific symptoms that a mother exhibits, a depressed mother's monitoring and involvement behaviors could be particularly high or particularly low. For example, a depressed mother could exhibit symptoms of loneliness and cognitive distortions that lead to her to be overly supportive and involved in her child's life. Another depressed mother could exhibit symptoms of withdrawal and psychomotor retardation that lead to her being unsupportive and disengaged in her child's life. This could lead to possible effects of parental monitoring and involvement being lessened because the two extremes of parental monitoring are averaging each other out. Therefore, depressed mothers potentially endorsing two extremes of parental monitoring and involvement could account for the lack of findings in the present study. Future research may need to examine how parental monitoring and involvement mediates adolescents' aggression and specific presentations of maternal depressive symptoms.

A third theory explored in this study was that the reciprocal relation between maternal depressive symptoms and adolescents' aggression is mediated by family functioning (reactivity in family communication and family cohesion), with gender moderating this relation. Findings did not support the hypothesis that family cohesion mediated the relation. No significant effects were found for mothers' or students' reports of family cohesion as mediators of the relation between maternal depressive symptoms and mothers,' students,' or teachers' reports of adolescents' aggression. In addition, despite multiple group models separated by gender being the best fit of the models, these models did not support the hypothesis. These findings are

inconsistent with previous research (e.g., Fendrich et al., 1990). One possible explanation for the lack of findings is that there is a difference in the measures used to assess family cohesion in the present study, as compared to previous studies that found this relation (e.g., Davies & Windle, 1997; Fendrich et al., 1990). In the present study, family cohesion was defined as behaviors and feelings associated with family communication and closeness (e.g., “Family members like to spend free time with each other” and “Family members feel very close to each other”) (Gorman-Smith et al., 1996). This differs slightly from how other researchers have defined family cohesion, namely as “the emotional bonding that exists between family members” (Place, Hulsmeier, Brownrigg, & Soulsby, 2005, p. 215). Differences in the way family cohesion can be defined could account for the lack of findings in the present study. Furthermore, because the definitions of family cohesion tend to be broad, scale items used to assess family cohesion could vary greatly from one study to the next and account for the lack of findings in the present study. Another plausible explanation for the lack of findings in the present study is the sample used in the present study. Past studies have generally used a predominantly Caucasian middle to upper class sample of families (e.g., Fendrich et al., 1990) whereas the present study used a predominantly African American sample of families from a range of socioeconomic status.

Partial support was found for the hypothesis that there would be significant indirect effects for mothers’ reports of reactivity in family communication as a mediator of the relation between maternal depressive symptoms and adolescents’ aggression. The results varied by source, such that significant effects were only found when using mothers’ ratings of adolescents’ aggression and mothers’ ratings of reactivity in family communication. Mothers’ reports of reactivity in family communication mediated maternal depressive symptoms as a predictor of mothers’ reports of adolescents’ aggression at two waves, as well as the relation of mothers’

reports of adolescents' aggression as a predictor of maternal depressive symptoms at one wave. Similar to patterns of results found in the autoregressive cross-lagged models and the parenting practices autoregressive mediation models, a reciprocal relation was found during the time period from the spring of seventh grade to the spring of eighth grade. The partial support found in the present study adds to a body of research that has displayed mixed findings for the role of reactivity in family communication as a mediator of the relation between maternal depressive symptoms and adolescents' aggression (e.g., Brody & Flor, 1996; Fendrich et al., 1990; Langrock et al., 2002; Pugh & Farrell, 2011; Reese-Weber & Kahn, 2005; Swaim et al., 2006). This finding adds to previous research by examining the relation longitudinally and by showing that the reciprocal relation only exists during the transition from seventh to eighth grade. One explanation for the findings in the present study is that the role of reactivity in family communication as a mediator of the relation between maternal depressive symptoms and adolescents' aggression becomes more salient during the particular transition from seventh to eighth grade (Bronfenbrenner, 1979). Perhaps family communication patterns become more conflictual as students transition from seventh to eighth grade and transition to the top of the middle school social hierarchy. An adolescents' adjustment to the transition to a new grade level and a new role in a social hierarchy at school could impact how an adolescent socializes with their family members in their home environment. These changes could lead to an increase in reactivity in family communication patterns between mothers and adolescents, which could impact maternal psychological functioning and adolescents' behaviors (Bronfenbrenner, 1979). This finding may highlight the importance of future studies focusing on times of transition when examining how family functioning mediates the relation between maternal depressive symptoms and adolescents' aggression.

Partial support was also found for the role of gender in the relation between maternal depressive symptoms, reactivity in family communication, and adolescents' aggression. More than half of the models were found to be most accurately represented separated by gender. Despite this finding, multiple group models separated by gender found few indirect effects. As mentioned earlier, it is possible that the lack of findings in the multiple group models is attributable to power concerns in the analyses or that gender differences are not present in full models that include mediators.

Although the study's primary focus was on the role of parenting practices and family functioning as mediators of the reciprocal relation, the present study also added to the current body of literature by displaying how maternal depressive symptoms and adolescents' aggression both are impacted by and impact parenting practices and family functioning variables. Consistent with previous research (e.g., Kilgore et al., 2000; Lee et al., 2006; Loeber & Dishion, 1984), higher levels of maternal depressive symptoms were associated with lower levels of discipline effectiveness and higher levels of reactivity in family communication. The findings were also consistent with previous research showing that higher levels of adolescents' aggression based on at least two informants reports of aggression was associated with lower levels of discipline effectiveness and higher levels of reactivity in family communication (e.g., Barry et al., 2009; Forman & Davies, 2003; Gorman-Smith et al., 2000; McCloskey & Lichter, 2003). The findings of the present study add to the literature by providing support for these relations among a high-risk, predominantly African American sample of adolescents and their families

Finally, the present study found that the patterns of relations among parenting practices, family functioning, and adolescents' aggression, varied across informants. This finding is consistent with previous research (e.g., Hartos & Power, 2000). The discrepancy of findings



across sources could be the result of source variance. For example, this may be accounted for by differences in measurement methods used for adolescents and mothers. Alternatively, it may highlight a difference in perceptions of the constructs measured in the present study (maternal depression, family functioning, parenting practices, and adolescents' aggression), which led to the pattern of findings in the present study. Perhaps mothers have a more accurate perception of ratings of parenting practices, family functioning and adolescents' aggression because of their role as a parent. On the other hand, it is possible that a mother's depressive symptoms have skewed her perceptions of the constructs examined in the present study (Richters, 1992). Hence, the present study adds to the literature by including multiple informants (e.g., Kraemer et al., 2003) and displaying that the significance and strength of effects are stronger when using the same reporter of parenting practices or family functioning and adolescents' aggression.

### **Limitations**

Several limitations in the present study should be acknowledged. The study used a sample of convenience from a larger intervention study. Although this provided a large and diverse sample, the sample also presented limitations. The present study excluded participants from the larger study who were included in a family intervention aimed at improving parenting and family functioning (MVPP, 2004) to avoid potential intervention effects that could have impacted parenting and family variables examined as mediators of the relation between maternal depressive symptoms and adolescents' aggression. Although this addressed the potential impact of the family intervention, participants in the school assigned to the universal intervention might have been influenced by the efforts to decrease school-level acceptance and maintenance of aggression (MVPP, 2004).

Another limitation of the sample in the present study is that participants included a predominantly minority sample of families from four sites representing a range of socioeconomic backgrounds. In addition, adolescents chosen in this study were identified as being at-risk for exhibiting aggressive behaviors and for exerting high levels of social influence on their peers. Therefore, findings may only generalize to minority samples of families with adolescents at-risk for aggression. In addition, by using the selected sample, this may have enhanced the chance that a relation would exist between maternal depressive symptoms and adolescents' aggression. For example, if adolescents included in the selected sample all exhibited higher levels of aggression, as compared to their peers, then this may increase the likelihood or the degree of the relation between maternal depressive symptoms and adolescents' aggression. However, this relation has already been replicated several times in the literature and has been replicated among a predominantly Caucasian, middle to upper class sample of families (e.g., Gelfant & Teti, 1990). Furthermore, the finding adds to the current body of literature by showing this relation exists among an understudied population (e.g., Marmorstein & Iacono, 2004). Despite research displaying the importance of studying low-income, minority families (e.g. Lansford et al., 2004; Ostler et al., 2000), past research has predominantly Caucasian, middle to upper class families. Therefore, the present study adds to the paucity of research examining this relation among minority families. Furthermore, because the sample used in the present study was predominantly African American, the present study did not have enough power to run multiple group models by race and ethnicity. Future research should explore the potential role of race and ethnicity in the relations examined in the present study.

The sample used in the present study also poses a limitation because the four sites used in the present study, specifically Chicago, Durham, Northeastern Georgia, and Richmond, varied

across an array of characteristics. This includes varying in racial composition of the sites, location, and setting of the schools (e.g., rural or urban setting). The diverse nature of the sample means that any observed effects needed to be fairly robust to be detected across sites and subgroups within each site. It is possible that findings in the present study may vary within subgroups (e.g., by race, setting, or site). Unfortunately, sample size limitations prevented the present study from examining these subgroup differences. However, even if the present study were able to run these analyses, it would be difficult to parse out how findings might have varied by subgroup. This is because variables such as race were confounded by site. For example, the Richmond site included a predominantly African American sample of families from primarily urban settings while the Northeastern Georgia site included a predominantly Caucasian sample of families from primarily rural settings.

A second limitation of this study is the assessment methods. More specifically, mothers' measures were administered orally, whereas the students' measures were administered on a computer. A computer assessment method may have been more reliable and consistent (e.g., not dependent on variables such as interviewer training). In addition, self-report bias may have confounded the data in the present study, such that mothers may have been more reluctant to report unfavorable behaviors (e.g., discipline practices) because they were reporting their answers aloud directly to a researcher (Kazdin, 2003). The present study helped to alleviate the potential effects of social desirability by including multiple raters for most of the measures. In addition, students were provided with a random student identification number and informed that their answers on the measures would be anonymous. Another limitation of the assessment methods is that maternal depressive symptoms were assessed using a self-report measure, the Center for Epidemiological Studies Depression Scale (CES-D). Despite the CES-D being a well-

validated measure for measuring elevations in depressive symptoms (Orme et al., 1986), it cannot be used as a diagnostic tool for diagnosing maternal depression. Therefore, this limits the researcher in accounting for the effects of co-morbidity (Forehand et al., 1986).

Another limitation of the assessment methods is the timing of the assessments. More specifically, data were collected in the fall of sixth and seventh grades, as well as the spring of sixth, seventh, and eighth grades. Levels of adolescents' aggression and maternal depressive symptoms may vary by time of year. For example, one type of depressive disorder called Seasonal Affective Disorder consists of episodes of depression that occurs at specific times of the year, such as during the winter (Tesar, 2010). The timing of the assessments or interval of time between waves in the present study may not fully capture the patterns of adolescents' aggression or maternal depressive symptoms that occurred across the school year. However, because the present study was interested in examining the impact of maternal depressive symptoms on subsequent changes in adolescents' aggression and the impact of adolescents' aggression on subsequent changes in maternal depressive symptoms, the present study was interested in change in each variable over a greater period of time.

A final limitation of the study is the longitudinal design. Longitudinal designs often present threats to internal validity that include test-retest bias, attrition, and instrumentation. The present study made efforts to alleviate threats to internal validity. For example, efforts were made during data collection to reduce attrition rates. In addition, the approach used in the present study made use of all available data in the analyses, unlike other approaches that exclude participants with one or more missing data points. The longitudinal design also presented several benefits to the present study. The longitudinal design added to the current body of literature's understanding of the dynamic nature of maternal depressive symptoms and adolescents'

aggression. Findings of the present study add to a growing body of research showing the cause and effect relation between maternal depressive symptoms and adolescents' aggressive behaviors (e.g., Gross et al., 2009).

### **Future Implications**

The present study contributes to the literature by studying the developmental continuities between maternal depressive symptoms and adolescents' aggression, as well as parenting and family mediators of the relation, within a predominantly minority sample of adolescents and their families from a range of socioeconomic statuses. Findings of the present study indicated that maternal depressive symptoms and adolescents' aggressive behaviors are positively correlated within the same wave of data and can impact one another in a reciprocal manner. Youth violence prevention efforts aimed at adolescents often focus on addressing peer-based components based on research showing an association between spending time with deviant peers and aggressive behaviors (Cillessen, Van Ijzendoorn, Van Lieshout, & Hartup, 1992; Dishion, Bullock, & Granic, 2002). Although it is valuable to address the influence of peers in adolescents' aggression, it is also important for researchers to consider the impact of parenting and family functioning on adolescents' mental health. In addition, it's also important to examine the impact of parents' mental health on aggressive outcomes among youth. Based on findings of the present study, it may be warranted for prevention and intervention efforts to consider the utility of including parent and family components or the utility of treating maternal depressive symptoms as a way to decrease aggression among adolescents.. Future researchers may want to use treatment outcome studies to examine how the treatment of a parent's mental health or an adolescent's maladaptive behaviors leads to changes in the other.

The present study also found that family functioning and parenting variables predicted subsequent changes in adolescents' aggression. Violence prevention and intervention efforts that include a parent or family component have primarily targeted parents of younger children, and the present study suggests that adolescence may be a pertinent time period to implement these types of programs (e.g., Farmer, Compton, Robertson, & Burns, 2002).

As research highlights, there are several challenges with implementing a preventive intervention for adolescents that contribute to at-risk adolescents being the most underserved population in prevention efforts. For example, adolescence marks a time period when youth are more emotionally reactive, engage in more risk-taking behaviors, experience difficulty in interpersonal relationships, strive for autonomy, and have increased emotional and behavioral difficulties (Eisenberg et al., 2005; Kazdin, 1993; Obsuth et al., 2006; Spear, 2000). In addition, there are several barriers to family and parental involvement in prevention and intervention programs, such as motivation, trust, and convenience (Cunningham, 1996). The findings in the present study that parenting and family variables are predictive of adolescents' aggression and maternal depressive symptoms suggest that adolescence may be an important time to implement a family based violence prevention program. Researchers may want to draw on programs that have been identified in the literature as model programs for treating maternal depression or adolescents' aggressive behaviors. For example, violence preventive intervention programs have been identified as being effective in treating conduct disorder among adolescents. This includes Functional Family Therapy (FFT; Alexander et al., 1998), Multisystemic Therapy (MST; Henggeler, Mihalic, Rone, Thomas, & Timmons-Mitchell, 1998), and called Multidimensional Family Prevention (MDFP; Liddle & Hogue, 2000) (Brosnan & Carr, 2000). Future researchers should aim to examine the effectiveness of these programs among understudied populations such

as the sample in the present study. Future research may also want to explore the possibility of adapting these interventions to take cultural considerations into account (e.g., Chow, Jaffee, & Snowden, 2003; Melfi, Croghan, Hanna, & Robinson, 2000; Kohn, Oden, Munoz, Robinson, & Leavitt, 2002).

Findings did not fully support that a reciprocal relation exists between maternal depressive symptoms and adolescents' aggression. Future studies may want to explore the dynamics and mechanisms that accounted for the reciprocal relation between maternal depressive symptoms and adolescents' aggression that have been found in previous studies (e.g., Gross et al., 2008, 2009). However, in models that examined the relation separately by gender, partial support was found among female adolescents for the reciprocal relation between maternal depressive symptoms and mothers' reports of adolescents' aggression. This contradicts two previous studies that found this relation existed among adolescent boys (Gross et al., 2008, 2009). In contrast to the present study, Gross and her colleagues (2008, 2009) assessed the relation between maternal depressive symptoms and youth disruptive behaviors across a greater span of time from infancy to adolescence. The samples also differed, such that the present study included a predominantly African American sample of male and female adolescents and their families, as compared to a Caucasian and African American sample of boys and their families (Gross et al., 2008, 2009). Furthermore, as compared to the present study which used reliable self-report measures of adolescents' aggression, previous studies utilized observations of aggressive behaviors that were conducted at only one time point every 1 to 2 years (Gross et al., 2008, 2009).

Because there are several differences between the present study and two previous studies (Gross et al., 2008, 2009), it is difficult to determine if the sample characteristics or assessment

methods may account for gender differences in the findings between the studies. With limited research on the relation between maternal depressive symptoms and aggression among adolescents, future research should aim to replicate findings in the present study and continue to examine the role of gender in this relation. Past research has displayed mixed findings for whether or not gender influences the relation between adolescents' aggressive behaviors and maternal functioning (e.g., Erel & Burman, 1995; Rothbaum & Weisz, 1994) and future research needs to help clarify the role of gender in this relation. Future research should examine this relation across a longer span of time among a diverse sample and include the transition into adolescence. Understanding the dynamics of the relation between maternal functioning and adolescents' aggression can help to inform future prevention and intervention efforts. For example, if this relation is strongest among female adolescents and mothers, then it may be most beneficial for family intervention and prevention efforts to focus their efforts on adolescent girls and their families. Future research should also examine what factors drive gender differences in the relation.

The present study did not find support for parental monitoring and involvement, family cohesion, or reactivity in family communication mediating the relation between maternal depressive symptoms and adolescents' aggression. Previous studies that have supported this relation were based on samples with different characteristics (e.g., predominantly Caucasian middle to upper class sample of families). Future research should determine if sample differences explain the lack of findings in the present study or if alternate variables account for the relation. The present study found partial support for parenting practices, specifically parent discipline practices, mediating the relation between maternal depressive symptoms and adolescents' aggression. Researchers have argued that youth violence prevention efforts should be



multifaceted and aim to focus on multiple contexts that impact a child's aggressive behaviors (e.g., Aisenberg, Trickett, Mennen, Saltzman, & Zayas, 2007; Kopp & Beauchaine, 2003). In addition, researchers have found that programs focused on improving parenting behaviors in conjunction with family functioning were most effective in leading to decreases in child behavior problems (Adams, 2001; Sayger, Horne, & Glaser, 1993). The findings in the present study provide partial support for the notion that parent discipline practices can have indirect effects on the relation between maternal depressive symptoms and adolescents' aggression. Future studies may want to continue to examine this relation and replicate findings in the present study to determine the utility of addressing parent discipline practices in future violence prevention programs. Future research should also continue to explore if additional parenting and family functioning variables that were not included in the present study may account for this relation and target these variables in future prevention efforts if they are found to impact this relation.

Finally, future research may want to build on the present study and address limitations of posed in this study. More specifically, it may be beneficial for future research to examine the reciprocal relation between maternal depressive symptoms and adolescents' aggressive behaviors across a longer span of time from infancy to early adulthood. In addition, continual and more frequently collected assessments across time could help to gain a better understanding of the developmental continuities between maternal depressive symptoms and adolescents' aggression. The utility of various assessment methods (e.g., paper and pencil assessment, computerized assessment, or oral administration) should also be examined to determine the best method to measure constructs. Additionally, future research may want to examine the relations among different samples, such that the sample in the present study consisted of a predominantly African American sample of adolescents' and their families from a range of socioeconomic statuses.

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Vita

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**EDUCATION**

- Ph.D.* (Expected: 2012) **Virginia Commonwealth University** Richmond, VA  
Major: Clinical Psychology, Child Track  
Dissertation: “The Reciprocal Relation between Maternal Depressive Symptoms and Adolescents’ Aggression: The Role of Parenting Practices and Family Functioning.”
- Clinical Internship* 2011-2012 **Virginia Treatment Center for Children** Richmond, VA  
APA-approved full-time clinical psychology internship
- M.S.* 2009 **Virginia Commonwealth University** Richmond, VA  
Major: Clinical Psychology, Child Track  
Thesis: “How Does Mothers’ Depression Influence Adolescents’ Aggression? The Role of Parenting, Family Functioning, and Informant Discrepancy”
- A.B.* 2006 **Princeton University** Princeton, NJ  
Major: Psychology  
Honors Thesis: “The Influence of Gender and Athletic Status in the Perpetuation of the Mental Illness Stigma.”
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**HONORS AND AWARDS**

- 2011 Recipient of the Outstanding Child/Adolescent Track Student Award  
Recipient of Customer Appreciation Award at the Virginia Treatment Center for Children for dedication and commitment to patient care
- 2010 Inducted into the Honor Society of Phi Kappa Phi
- Recipient of the *Black History in the Making Award* for academic excellence and service to the University community

Selected as one of twenty doctoral graduate students to attend the Summer Institute on Youth Violence Prevention at the University of California, Berkeley

Recipient of the Society for Prevention Research Minority Travel Scholarship

Recipient of the VCU Psychology Department Travel Award

2009 Academic Centers of Excellence in Youth Violence Prevention Student Poster Award

Who's Who Merit Achievement Award

2005 Summer Research Opportunity Program (SROP): Selected from hundreds of applicants across the nation to participate in an intensive 10-week research program at the University of Michigan.

2002 Who's Who Merit Achievement Award  
National Honors Society, Spanish Honors Society, Science Honors Society

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## CLINICAL EXPERIENCE

**Virginia Treatment Center for Children**, Richmond, VA Summer 2010-Summer 2011  
Served as an inpatient and outpatient therapist at the Virginia Treatment Center for Children, a facility that includes acute care and evaluations and outpatient family and individual therapy. Duties included serving as an acute in-patient therapist for children and adolescents for admissions, individual and family therapy, and discharges. This also included attending treatment team grand rounds, case presentations, one-to-one supervision meetings, and case management. Also included serving as an outpatient therapist for children and adolescents and one-to-one supervision meetings. Additional experiences included specialized and didactic training in areas like Projective Testing and Comprehensive Crisis Management.

**Autism Clinic**, Richmond, VA Fall 2009-Spring 2010  
Served as a staff therapist for the Autism Clinic, which offers a variety of empirically supported assessment and treatment intervention services to children and adolescents with Autism Spectrum Disorders (ASDs) and their families. Clinical experiences included child- and family-focused interventions, such as individual therapy for children and adults, parent training, and social groups. Also included one-to-one supervision and weekly group supervision meetings.

**ADAPT**, Chesterfield, VA Summer 2009-Spring 2011  
Administered the Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS) and associated intake interviews for children and their parents being enrolled into a multi-focus therapy in a community mental health clinic for children with comorbid internalizing and

externalizing disorders for the Chesterfield-VCU Adaptation of Depression and Anxiety Psychological Treatments for Children (ADAPT) Project. Trained to reliability on the K-SADS.

**VABODE**, Richmond, VA Summer 2009-Spring 2011  
Served as an outpatient and in-home counselor for Virginia's Associated Behavioral Outcomes and Developmental Experts of Virginia (VABODE). Clinical experiences included structured intake assessments and psychodiagnostic assessments for children, adolescents, and adults. Clinical experience also includes individual and family therapy for children and adults, as well group therapy for children and adolescents. Also included one-to-one supervision and weekly group supervision meetings. Additional experiences include case management and didactic training in areas like HIPAA, Child Protective Services, and Medicaid Interventions.

**McShin Foundation**, Richmond, VA Spring 2009-Fall 2010  
Served as an outpatient therapist and group leader at the McShin Foundation, a non-profit full service Authentic Recovery Community Organization. Clinical experiences included individual therapy and leading weekly group therapy sessions. Experience included weekly group and individual supervision meetings.

**T.E.E.N.S.**, Richmond, VA Spring 2009-Summer 2010  
Served as a behavioral management therapist and group leader for the T.E.E.N.S. Program (Teaching, Encouragement, Exercise, Nutrition and Support), a multidisciplinary weight management clinic in collaboration with the VCU departments of Exercise Science, Family Medicine, and Psychology. Clinical work included structured intake assessments and behavioral management sessions for children and adolescents, ages 11 to 18, as well as co-leading a parent psychoeducation group. Experience included weekly group supervision meetings.

**NOURISH**, Richmond, VA Spring 2009- Summer 2009  
Administered structured intake assessment interviews with children, ages 6 to 11, as part of an evaluation for an innovative intervention for ethnically diverse parents, which focuses on helping parents role model and teach their children healthy behaviors.

**Center for Psychological Services and Development**, Richmond, VA Summer 2008-  
Summer 2010  
Served as a staff therapist at the Center for Psychological Services and Development, which is a university mental health clinic that offers psychological services to the Richmond community as well as to the university community. Clinical experiences included individual, couples, and family therapy for children and adults, as well as administration of psychodiagnostic assessments for children, adolescents, and adults. Also included live supervision and weekly group and individual supervision meetings.

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## RESEARCH EXPERIENCE

**Dissertation**, Richmond, VA Summer 2010-Spring 2012



Conducting an empirical research study titled: The Reciprocal Relation between Maternal Depressive Symptoms and Adolescents' Aggression: The Role of Parenting Practices and Family Functioning. Dissertation uses data from the Multisite Violence Prevention Project and examines two mechanisms believed to account for the relation between maternal depressive symptoms and adolescents' aggression: parenting practices and family functioning.

**Master's Thesis**, Richmond, VA

Fall 2008-Spring 2009

Conducted an empirical research study titled: How Does Mothers' Depression Influence Adolescents' Aggression? The Role of Parenting, Family Functioning, and Informant Discrepancy. Master's thesis utilized data from the Multisite Violence Prevention Project and examined three mechanisms believed to account for the relation between maternal depression and adolescents' aggression: parenting practices, family functioning, and informant discrepancy.

**Science Writer**

Spring 2009-Summer 2009

Science Writer for the *Collection of Evidence-Based Treatment Modalities for Children and Adolescents with Mental Health Needs, 4<sup>th</sup> Edition* for the Virginia Commission of Youth, specifically providing research and writing services for the *Juvenile Offenders* and *Substance Abuse* sections. The duty of the science writer was to summarize the current literature on mental health treatments proved to be effective in treatment children and adolescents. The overall purpose of the project is to coordinate the collection of empirically based information for an audience of educators, service providers, parents, caregivers, and other seeking information on evidence-based mental health treatments for youth.

**Research Assistantship at Virginia Commonwealth University**

Fall 2007-Summer 2011

Research Assistantship at the Clark Hill Institute of Positive Youth Development at Virginia Commonwealth University, working with Professor Albert Farrell, Ph.D. Research included developing effective violence prevention programs for high-risk urban adolescents. Research focused on identifying risk and protective factors related to problematic behavior among adolescents in high risk environments, with a particular focus on the factors that promote positive development. Projects included implementing a debriefing interview to identify variables that may impact the efficacy of violence prevention and intervention efforts and the development of a think-aloud approach to cognitive assessment to identify the underlying processes that may influence how minority adolescents respond to problem situations. Research duties included measure development, literature reviews, coding, qualitative and quantitative data analysis, and weekly Institute meetings and lab meetings.

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## PUBLICATIONS

Pugh, K.L. and Farrell, A. (2011). The impact of Maternal Depressive Symptoms on Adolescents' Aggression: Role of Parenting and Family Mediators. *Journal of Child and Family Studies, Online First, 24 June 2011*, doi:10.1007/s10826-011-9511-y .

## PROFESSIONAL PRESENTATIONS

- Bettencourt, A.F., Pugh, K.L., and Farrell, A. (2011). Urban Adolescents' Cognitive Responses to Peer Victimization: Does Psychosocial Adjustment Play a Role? Paper Symposium for the Society for Research on Child Development 2011 Biennial Meeting in Montréal, Quebec, Canada, March 31-April 2, 2011.
- Pugh, K.L. and Farrell, A.D. (November 2010). The Transactional Relation between Maternal Depressive Symptoms and Adolescents' Aggression: The Role of Parenting and Family Functioning. Poster Presentation for the Association for Behavioral and Cognitive Therapies 44<sup>th</sup> Annual Meeting in San Francisco, CA, November 18-21, 2010.
- Pugh, K.L., Bettencourt, A.B., Titchner, D.K, Mehari, K.R., and Farrell, A.D. (June 2010). An Evaluation of the Application of the Articulated Thoughts in Simulated Situations Paradigm to Urban African American Adolescents. Poster Presentation for the Society for Prevention Research at the SPR 18<sup>th</sup> Annual Meeting in Denver, CO, June 1-4, 2010.
- Titchner, D.K., Pugh, K.L., Mehari, K.R., and Farrell, A.D. (June 2010). Development and Evaluation of a Measure of Social Problem Solving Skills for Urban Adolescents. Poster Presentation for the Society for Prevention Research at the SPR 18<sup>th</sup> Annual Meeting in Denver, CO, June 1-4, 2010.
- Pugh, K.L. and Farrell, A.D. (March 2010). Impact of Maternal Depression on Adolescent Aggression: Evaluation of Gender Differences in Two Underlying Mechanisms of Influence. Poster Presentation for the Society for Research on Adolescence at the SRA Biennial Meeting in Philadelphia, PA, March 11-14, 2010.
- Pugh, K. and Farrell, A.D. (April 2009). How Does Maternal Depression Influence Adolescent Aggression? The Role of Parenting, Family Functioning, and Depression Distortion. Poster Presentation for Graduate Student Association Annual Research Symposium and Exhibit at Richmond, VA, April 21, 2009.
- Pugh, K. and Farrell, A.D. (April 2009). How Does Maternal Depression Influence Adolescent Aggression? The Role of Parenting, Family Functioning, and Depression Distortion. Poster Presentation for the Society for Research and Child Development at the 2009 Biennial Meeting in Denver, CO, April 2-4, 2009.
- Pugh, K. and Farrell, A.D. (March 2009). How Does Maternal Depression Influence Adolescent Aggression? The Role of Parenting, Family Functioning, and Depression Distortion. Poster Presentation for the Center for Disease Control Poster for 2009 Academic Centers of Excellence in Youth Violence Prevention Student Poster in Atlanta, Georgia, March 2, 2009.
- Bettencourt, A.F., Pugh, K.L., & Farrell, A.D. (November 2008). A Novel Approach to the Measurement of Adolescents' Cognitive Patterns in Response to Peer Provocation Situations: The Articulated Thoughts in Simulated Situations Paradigm. Poster Presentation for Association for Behavioral and Cognitive Therapies (ABCT) at the Association for Behavioral & Cognitive Therapies Annual Convention in Orlando, Fl., November 13-16.

Pugh, K., Weissman, A.S., Harrison, T.L., Chu, B.C., & Wood, J. (November 2007). Relationship between Parent-Child Interaction and Symptom Change in CBT for Anxious Youth, an Update to Previous Research. Poster Presentation for Graduate Student Association Annual Research Symposium and Exhibit at Richmond, VA, April 15, 2009.

Pugh, K., Weissman, A.S., Harrison, T.L., Chu, B.C., & Wood, J. (November 2007). Relationship between Parent-Child Interaction and Symptom Change in CBT for Anxious Youth. Poster Presentation for Association for Behavioral and Cognitive Therapies (ABCT) at the Association for Behavioral & Cognitive Therapies Annual Convention in Philadelphia, PA, November 15-18.

Pugh, K. (May 2006). The Influence of Gender and Athletic Status in the Perpetuation of the Mental Illness Stigma. Poster presentation for Senior Thesis at Princeton University in Princeton, NJ.

Pugh, K. (August 2005). Risk and resilience among college student athletes. Poster presentation at the University of Michigan Summer Research Opportunity Program in Ann Arbor, MI.

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## TEACHING AND WORKSHOPS

*Mental Health Training* Summer 2009-Summer 2011  
Co-Leader, Virginia's Associated Behavioral Outcomes and Developmental Experts of Virginia  
Conducted monthly training workshops with in-home counselors on a variety of topics (e.g., suicide identification and prevention)

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## SPECIALIZED TRAINING

**University of California, Berkeley, Berkeley, CA** Summer 2010  
Attended the annual Summer Institute on Youth Violence Prevention, a one week specialized training opportunity for doctoral graduate students from various disciplines who conduct research on youth violence prevention. Training aimed to stimulate discussion and research ideas in the area of youth violence prevention and included training by professionals with expertise in youth violence prevention within psychology, criminal justice, community-based programs, sociology, ethnography, and public policy. Training focused on the prevalence of youth violence prevention and sources of data, the impact of violence on immigrant communities, the role of family and culture in youth violence, identifying funding sources for research in the etiology and prevention of youth violence, and intervention design, implementation, and evaluation. Also included small group discussions and individual student's presentation and discussion of a proposed research project.

**Virginia Commonwealth University, Richmond, VA** Spring 2009

Attended the 47th Annual Child Psychiatry Spring Forum: *Embracing the Whole Child: Strategies for Enhancing School Mental Health*, an annual workshop sponsored by mental health organizations in the larger Richmond area. Training included engaging parents as partners in school mental health, mentoring in schools, implementing high quality evidence-based school mental health services, functional behavioral analysis, and positive effective behavior intervention plans.

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## **PROFESSIONAL AFFILIATIONS**

Association for Behavioral and Cognitive Therapies (Student Member), 2005-present  
Society for Prevention Research (Student Member), 2007-present  
Society for Research on Adolescence (Student Member), 2007-present  
Society for Research on Child Development (Student Member), 2008-present  
Honor Society of Phi Kappa Phi, 2010-present

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