

THE ADDITIVE AND SYNERGISTIC EFFECTS OF A PARENT-PEER MODEL ON THE
DEVELOPMENT OF EARLY ANTISOCIAL BEHAVIOR IN CHILDREN

A Dissertation by

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ABSTRACT

The additive and synergistic effects of a parent-peer model in the development of child antisocial behavior from the ages of 5 to 7 was examined. Participants included a community sample of 267 children at kindergarten entry, 134 boys and 133 girls. Participants' mean age was 5.3 years at the start of data collection (fall of kindergarten), with final data collection in the spring of first grade (mean age 7.2 years). Multi-method, multi-informant methods were used to examine skilled and unskilled parenting, as well as peer processes, including coercion, rejection, and deviancy training to the development of overt and covert antisocial behavior. Both ineffective parenting and deviant peer processes were related to chronic levels of covert and overt antisocial behavior, but peer processes contributed in a stronger fashion. However, only ineffective parenting processes reliably predicted individual differences in children's growth in overt and covert antisocial behavior. These results support the notion that interventions may need to target social processes in multiple settings, to include parents and peers, and perhaps teachers. Further implications for prevention and intervention are discussed.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Longitudinal Studies	7
Intervention Studies	11
Findings from the Current Sample	17
Present Study	20
II. METHODS	22
Participants	22
Procedures for Parenting Measures	22
Parenting Measures	24
Procedures for Peer Measures	27
Peer Measures	27
Procedures for Measure of Child Antisocial Behavior	29
Child Measures	29
III. RESULTS	32
Preliminary Analyses and Construct Building	32
SEM Tests of the Parent-Peer Model of Early Antisocial Behavior	35
IV. DISCUSSION	39
REFERENCES	49
APPENDIX	54

LIST OF TABLES

Table	Page
1. Parent, Peer, and Child Antisocial Measures	55
2. Descriptive Statistics for Parent, Peer, and Child Measures	56
3. Correlations among Parenting Measures	59
4. Factor Loadings for the Parent Construct	60
5. Correlations among the Peer Measures	61
6. Factor Loadings for the Peer Construct	62
7. Factor Loadings for the Overt and Covert Antisocial Behavior Constructs at Each Developmental Time Point	63
8. Correlations among Overt and Covert Antisocial Behavior Constructs in Fall and Spring of Kindergarten and First Grade	64
9. Descriptive Statistics for Constructs	65
10. Parent and Peer Construct Correlations	66

LIST OF FIGURES

Figure		Page
1.	Parent-Peer Model in Growth of Overt Antisocial Behavior	67
2.	Parent-Peer Model in Growth of Covert Antisocial Behavior	68

CHAPTER 1

INTRODUCTION

Antisocial behavior is one of the most expensive mental health disorders in terms of human suffering and in terms of financial costs to society. In an exhaustive evaluation of the aggregate direct and indirect costs of crime, including the impact on quality of life, Anderson (1999) estimated costs exceeding one trillion dollars per year. Given the substantial impact of antisocial behavior, it is imperative that research examines the etiology of antisocial behavior in order to identify malleable risk factors that can be targeted in preventive interventions to reduce the prevalence of such behavior and to ameliorate its enormous burden to society. The present research examined the independent contribution and synergistic association of parenting (skilled and unskilled) and peers (coercion, rejection, deviancy training, and deviant peer association) with child externalizing behavior (overt and covert antisocial behaviors) during childhood.

The foundations for antisocial behavior in adulthood are laid down in childhood (Forgatch, Patterson, DeGarmo, & Beldavs, 2009), and lead to significant problems in the home, school, and community settings. Not only do youth engaging in antisocial behavior experience negative personal outcomes, but their behavior is disruptive and aversive to individuals with whom they interact (Dishion & Patterson, 2006). Antisocial behavior is evident in children as early as age five (Snyder, McEachern, Schrepferman, Just, Jenkins, Roberts, & Loftgreen, 2010), and constitutes a large percentage of referrals for clinical intervention (Kazdin, 1993). Children engage in both overt (i.e. disruptive, defiant) and covert (i.e. lying, stealing) forms of antisocial

behavior (Dishion & Patterson, 2006). Although a percentage of children evidencing aggressive and oppositional behavior as toddlers show decreases in these behaviors as a function of age, others follow a developmental trajectory of continued antisocial behaviors into the early school years (Shaw, Gilliom, Ingoldsby, Nagin, 2003). Without intervention, the antisocial behavior of these children may persist and grow into adolescence and adulthood. Studies examining factors associated with antisocial behavior that persists into the early school years are warranted in order to develop effective preventive interventions.

Studies investigating antisocial behavior in children have primarily focused on all male samples. This is likely due to higher prevalence rates of conduct disorder found for boys in epidemiological studies (Maughan, Row, Messer, Goodman, & Meltzer, 2004). Conduct disorder is one of the two childhood antisocial disorders, along with oppositional defiant disorder (ODD). In a national survey of 9,282 English speaking adults in the United States, Nock, Kazdin, Hiripi, & Kessler (2006) estimated the lifetime prevalence of conduct disorder at 12.0% for males, and 7.1% for females, a significant gender difference. The authors also examined classes of conduct disorder (less than 1 symptom, rule violation, deceit/theft, aggression, severe covert) and found that individuals engaging in aggressive behaviors had a median age of onset of 7.0 years, with individuals in the other covert classes experiencing a later onset (12.0 to 14.0 years).

A recent study of lifetime prevalence rates and persistence of oppositional defiant disorder (Nock, Kazdin, Hiripi, & Kessler, 2007) found non-significant gender differences in the prevalence of ODD, with males estimated lifetime prevalence at 11.2%, and females at 9.2%. The Nock et al. (2007) study further found average onset of ODD at age 4, with a longer duration of symptoms with earlier age of onset, further indicating the need to examine causal

mechanisms of antisocial behavior at early developmental stages. The non-significant gender differences point to the importance of examining the development of antisocial behavior of females as well as males. The present study examined causal mechanisms of antisocial behavior using a roughly equal sample of male and female children beginning at school entry.

Various approaches have been used to study the development of antisocial behavior. The most common approach involves examining parenting practices and peer relationships as independent contributing factors to antisocial behavior in children and adolescents. Particular attention has been given to the importance of parents in the preschool years; indeed, parents are powerful agents during the earlier life of a child. Researchers tend to focus on the importance of peer relationships after children enter school, particularly in the preadolescent and adolescent years. However, the importance of studying the development of behavior within an ecological framework has been asserted. As noted by Bronfenbrenner (1992), development throughout the life span is impacted by the multiple settings experienced by individuals, as well as synergistic effects among those settings. Parenting and peer ecologies are important contexts in the development of the child, and their contribution to the development of antisocial behavior is evident in decades of research. Rather than studying the impact of family and peer contexts on the developing child separately, a better understanding of risk and protective factors related to the development of antisocial behavior may be facilitated by examining the additive and synergistic effects of these two systems. Dishion and Patterson (2006) note that a model which examines parents and peers together may provide a more powerful and flexible approach to developing preventive interventions, and indicate the

surprising lack of data regarding combined parent-peer models in the early development of antisocial behavior. The present study sought to address this deficit in research.

Reid and Eddy (1997) proposed a developmental model of antisocial behavior which purports that antecedents to antisocial behavior begin prenatally, and follow an identifiable trajectory into young adulthood. According to this model, parenting practices and child temperament in infancy are important antecedents to the development of early conduct problems. A difficult temperament paired with unskilled parenting may set the child on a trajectory for early problems including noncompliance, tantrums and aggression. In early childhood (ages 2 to 5) parenting practices, including coercion, rejection, low levels of contingent reinforcement for cooperation, a lack of parental involvement, and inconsistent discipline are the primary mechanisms associated with child conduct problems. The relation between early problems and poor parenting is reciprocal; persisting and frequent child conduct problems may contribute to unskilled parenting, such as giving in to child demands, reduced parental warmth and limit setting, and disengagement. Given these reciprocal effects, an entrained transactional process is engendered which increases the likelihood that the child continues to engage in conduct problems and places the child on a trajectory for early antisocial behavior.

With the transition to school, peers begin to play a role in the development of early antisocial behavior. Children who are under-socialized, aggressive and non-cooperative in the home setting are likely to experience peer coercion and rejection which further accelerate the risk for early antisocial behavior. These same child behaviors lead to negative attention and labeling by teachers, further reducing social and academic opportunities and success (Reid &

Eddy, 1997). Ineffective and coercive parenting, peer coercion and rejection, and teacher disengagement are likely to additively or synergistically contribute to the persistence and growth of child conduct problems during the early elementary school years. During adolescence (ages 12 to 18 years) poor parental monitoring, low parental involvement, association with deviant peers, and academic problems continue to contribute to antisocial behavior and its continuation into young adulthood.

In a paper examining the beneficial impact of the Oregon Model of Parent Management Training (PMT-O), Patterson, Forgatch, and DeGarmo (in press) discuss a theoretical model of the development of antisocial behavior that informs their intervention. This model is based on Social Interaction Learning (SIL) which posits two separate causal mechanisms in the development of antisocial behavior. The first mechanism involves unskilled parenting, with a focus on coercive exchanges between the parent and child. The second mechanism involves the generalization of antisocial behaviors learned at home to school and community settings. Antisocial behaviors may result in rejection by normative peers which, in turn, may lead to association with deviant peers. Deviant peers then model and reinforce a wide variety of antisocial behaviors, as well as providing the opportunity to co-participate in such behavior in the community. As with the model described by Reid and Eddy (1997), this intervention model endorses the conjoint importance and role of parenting and peers in the development of antisocial behavior during early to middle childhood. The present study examined the additive and synergistic contribution of parents and peers on the development of antisocial behavior during the early elementary school years. The present study also expanded early peer risk

factors to include peer deviancy training as well as coercion and rejection as a core process that increases persistence and growth in early antisocial behavior.

Other developmental models of early antisocial behavior also suggest the conjoint importance of parents and peers. Dodge, Greenberg, Malone, and the Conduct Problems Prevention Group (2008) examined their model using data collected from children at kindergarten entry through the 11th grade. Evidence from this investigation supports a cascading model of antisocial development, in which early harsh parenting is predictive of early antisocial behavior, and association with deviant peers is predictive of antisocial behavior in the middle school years. The current study differs from the Dodge et al. model in that the premise tested in this report asserts that peer deviancy training occurs and has an impact on antisocial development during early elementary school, much earlier than its occurrence and effects during the middle school years as posited by Dodge et al. (2008).

The present study focused on the contribution of parent and peer relationships at child ages 5 to 6 years to growth of antisocial behavior from ages 5 to 7 years. As noted by Reid and Eddy (1997), to usefully inform intervention, malleable targets must be identified at various developmental stages. In order to generate beneficial preventive effects, these intervention targets should be clearly specified, involve processes that have durable effects on child behavior, and focus on multiple developmental settings. The present study examined both the independent and synergistic association of parents and peers to the development of antisocial behavior during the early elementary school period. Establishing additive and/or synergistic associations would infer that early interventions for antisocial behavior may need to target both parent and peer ecologies to have optimal preventive effects.

Longitudinal Studies

Although there is little research examining parent-peer models in early childhood, there has been some attempt to examine parent-peer models in relation to preadolescent, adolescent, and young adult antisocial behavior. For example, Dishion, Nelson, and Bullock (2004) investigated parenting processes and association with deviant peers in the Oregon Youth Study (OYS), which consisted of 206 fourth-grade boys. Video-taped observations were used to obtain objective data regarding parent and peer relationship processes. These observations were coded for family management processes, including parental monitoring, quality of the relationship, and positive parenting, as well as deviant peer processes such as deviant talk during peer interactions and peer antisocial behavior. Results indicated that youth whose parents engaged in low levels or diminished family management engaged in higher levels of deviant peer relationship processes between the ages of 17 to 18. The authors also found a bidirectional relationship, in which youth engaged in early deviant peer processes subsequently experienced less effective parenting. The interaction between low levels of family management and involvement in deviant peer processes predicted marijuana use at age 18. This study provides support for a parent-peer model in the development of antisocial behavior in adolescence.

Snyder, Dishion, and Patterson (1986) examined the synergistic effects of parenting and deviant peers on future acts of antisocial behavior in a sample comprised of fourth, seventh, and tenth grade boys. Methods included teacher ratings, structured interviews and videotaped observations, peer nominations, and measures of antisocial attitudes. Results indicated that both poor parental monitoring and friendships with deviant peers were related to antisocial

behavior, and that the synergistic effects of these variables predicted later antisocial behavior as measured by involvement with juvenile court. This study points to the importance of examining parent-peer models in the development of antisocial behavior.

Given the lack of data regarding the childhood antisocial behavior of females, Miller, Loeber, and Hipwell (2009) examined oppositional and conduct problems of seven and eight-year-old girls, assessing the contribution of parent and peer socialization to antisocial behavior. The sample included 588 girls, with data collection beginning at age five and outcome measures at ages seven and eight. Measures included self-ratings of parenting practices, parent and teacher ratings of oppositional and conduct disordered behavior, and child ratings of involvement with delinquent peers. Sixty-eight to 70% of the participants had at least one friend who had engaged in minor acts of delinquent behavior, with one in ten participants reporting at least one friend who had engaged in more serious forms of antisocial acts. Results indicated that both parenting (harsh parenting and low parental warmth) and association with peers who engaged in delinquent behavior predicted oppositional and conduct disordered behavior as indicated by parent ratings and child self-report. Interestingly, association with deviant peers at age seven did not predict antisocial behavior at age eight years, while parenting was predictive of antisocial behavior. This study adds to the literature regarding both antisocial behavior in young female children and the contribution of parents and peers to antisocial behavior but does not address potential synergistic effects.

In examining developmental trajectories of antisocial behavior, Ingoldsby, Shaw, Winslow, Schonberg, Gilliom, and Criss (2003) collected data on young male children ($n = 218$) between the ages of two and ten years old. The authors examined the impact of conflict between

parents and children and children's association with deviant neighborhood peers on early and late-starting developmental trajectories of antisocial behavior. Measures included the Child Behavior Checklist (CBCL; Achenbach, 1992), observations of parent-child interactions, child ratings of association with deviant neighborhood peers at age 10, and a self-report measure of antisocial behavior at age 10. Results indicated that parent-child conflict predicted a developmental trajectory involving early displays of antisocial behavior. Early starting antisocial boys were also twice as likely to have a friendship with a deviant child in the neighborhood. Relationship with deviant neighborhood peers was the only variable to differentiate between persisting and decreasing antisocial behavior at age 10. Ingoldsby et al. (2003) add to our current understanding of the additive impact of parent-child conflict and association with deviant peers on the development of antisocial behavior in young children.

Although the majority of studies investigating the relationship of parenting to antisocial behavior have examined unskilled parenting, such as low parental monitoring, harsh discipline, and lack of positive involvement, a longitudinal study by Pettit, Bates, and Dodge (1997) examined the relationship of supportive parenting and peer relationships, among other variables, to child outcomes, including behavioral problems. This study began data collection at kindergarten entry, and included male and female children (n = 585). Measures included parent and child interviews, post interview impressions completed by the interviewer, the Teacher Rating Form (TRF; Achenbach & Edelbrock, 1986), and the Teacher Checklist of Peer Relations (Coie & Dodge, 1988). Supportive and harsh forms of parenting were measured separately, although the harsh parenting construct was comprised of self-report questions regarding restrictive discipline only. Of interest to the current research, results indicated that low levels of

both proactive teaching and calm discussion by parents were predictive of externalizing behaviors. Additionally, firm discipline and high levels of calm discussion by parents were related to higher social skills in children. Lower levels of social skills in kindergarten were related to higher rates of externalizing behaviors. This study addresses the importance of examining both skilled and unskilled parenting in relation to children's peer relationships as well as externalizing behavior.

In summary, evidence from longitudinal studies provides support for a parent-peer model in the development of antisocial behavior. Results of longitudinal research indicate that in older samples, unskilled parenting and association with deviant peers have synergistic effects on the development of antisocial behavior. There is evidence to support the hypothesis that antisocial behavior in girls results from harsh parenting, low parental warmth, and association with deviant peers. The research also indicates that skilled parenting is related to higher levels of social skills at school entry, potentially reducing the risk of externalizing behavior problems. However, there are several limitations in our current understanding of the synergistic effects of parents and peers to early antisocial behavior. The majority of studies examining parenting and peer processes begin data collection in middle childhood, thereby leaving some question as to the extent of the additive and synergistic effects of parents and peers on the development of antisocial behavior in early childhood. Previous studies of young children also focus more on the role of peer rejection and coercion, without recognition of the potential role of peer deviancy training in early childhood. Finally, the majority of studies utilized all male samples. An exception to this involved the study of first grade girls by Miller et al. (2009); however, this study relied exclusively on self-report data. Although several longitudinal studies have included

observations of parent and peer processes, thereby providing more objective data regarding these processes, these studies also focused on preadolescent and adolescent samples.

As indicated by Reid and Eddy's (1997) proposed model of antisocial development, the additive and synergistic effects of parents and peers have conjoint effects during early development, supporting the need for studies that focus on early childhood (i.e. school entry). Most of the evidence collected in longitudinal studies regarding parenting processes has focused on unskilled parenting, and does not take into account the potential impact of skilled parenting. The present study utilized a broader parenting construct in which both skilled and unskilled parenting were examined in the context of a parent-peer developmental risk model.

Intervention Studies

There have been some large scale randomized controlled trials of preventive interventions targeting antisocial behavior based on a theoretical model which hypothesizes that both parents and peers contribute to the development of antisocial behavior. The success of these preventive interventions provides some support for a parent-peer model in relation to antisocial behavior in young children. For example, a randomized controlled trial preventive intervention that lends support to a parent-peer model of antisocial development is the Fast Track Prevention Trial (The Conduct Problems Prevention Research Group, 2001). This longitudinal study included 891 participants at high risk for developing problem behaviors as adolescents. The preventive intervention included a teacher component, in which teachers taught children skills in identifying emotions, playing with others, behavioral regulation, and solving problems in peer social settings. The intervention also included a component in which parents were taught skills in positive involvement, tactics to reduce child disruptive behavior,

and appropriate developmental expectations. Parents and children participated in groups to practice skills to promote a positive relationship. Home visits were used to practice skills learned in group. Therefore, this preventive intervention focused on parenting and peer ecologies in efforts to prevent later antisocial behaviors. Outcomes at the end of the first year indicated fewer behavioral problems, less rejection by peers, and more positive peer interaction for those children receiving the intervention. Follow-up in third grade indicated that parents in the intervention group reported fewer aggressive behaviors, according to Parent Daily Reports (PDR; Chamberlain & Reid, 1987). Additionally, by the end of third grade teachers also reported lower rates of disruptive, aggressive behaviors by children receiving the intervention. However, there was not a significant intervention effect at the end of third grade for aggressive behavior based on peer nominations. The authors note that one limitation of the third-grade follow-up was its primary reliance on parent and teacher reports, whereas observational data were used at the end of first grade. This study provides some support for a parent-peer model in relation to the development of antisocial behavior in young children. However, the intervention did not examine a peer versus parent intervention in separate groups; therefore, we cannot conclude that intervention is necessary in both ecologies.

Linking the Interests of Families and Teachers (LIFT) is a preventive intervention designed for delivery to elementary school-aged children (first and fifth grade), with classroom, playground and parent components (Eddy, Reid, & Fetrow, 2000). The classroom component entailed teaching children problem solving and social skills through role plays, group practice, and rewarding positive behavior. Children earned rewards for prosocial behavior displayed during unstructured time on the playground. Parents participated in six group sessions, with

lessons that correspond to classroom components. Parents were taught skills to encourage positive peer interactions in the first grade, and parents of fifth-graders were taught skills in negotiation and problem solving. Outcomes were measured through interviews with children, parents, and teachers, as well as observations of classroom, playground, and parent-child interactions. LIFT has been found to decrease antisocial behavior in children, including reductions in observed aggressive behavior and affiliation with deviant peers. The results of this preventive intervention provide further evidence for a parent-peer model in the development of early antisocial behavior, although, as with the FAST track study, parent- and peer-focused interventions were not contrasted.

Another large-scale randomized controlled trial preventive intervention lends support to a parent-peer model, including data from a follow-up 15 years after intervention (Boisjoli, Vitaro, LaCourse, Barker, & Tremblay, 2007). The Montreal Longitudinal Experimental Study (Tremblay et al., 1992) utilized a preventive intervention with parent, peer, and teacher components targeting boys at risk for antisocial behavior. Based on teacher ratings of disruptive (aggression, oppositional behavior, hyperactivity), anxious, inattentive, and prosocial behavior at kindergarten, 250 high risk boys were randomly assigned to intervention or control. Of these families, 172 agreed to participate, although all 250 boys were included in the study as an intention-to-treat (ITT) analysis. The preventive intervention included social skills training at school, Parent Management Training-Oregon (PMT-O; Patterson), and teacher education on working with at-risk boys. Boisjoli et al. (2007) collected follow-up data when the youth were 24 years of age, using as outcome criteria achievement of high school diploma and criminal record. Results indicated that as adults, individuals who had participated in intervention had higher

rates of high school completion and lower rates of criminal records when compared to the control group. Additionally, there were no significant differences between the intervention group and the low-risk comparison group on rates of high school graduation and criminal records. These results provide support for the long-term beneficial effect on the reduction of antisocial behavior when applying a preventive intervention in multiple ecological settings at school entry. However, there was no comparison involving a parent-only, peer-only, and a combined parent and peer focused interventions.

Webster-Stratton and Hammond (1997) conducted a randomized control trial of a parent only, child only, and a combined parent and child intervention to treat conduct problems in children ages 4 to 7. The child only intervention involved teaching children problem-solving skills, social skills, making friends, attention skills, and skills in how to handle rejection and teasing by peers. The parent only intervention involved parents meeting in group sessions to watch and discuss a series of videotapes on parenting skills. Multi-method and informant outcome measures were used, including observations of interaction with parents and peers. Results indicated that the parenting only and parent plus child intervention showed greater improvements in parenting behaviors and parent-reported child behavior problems than the child only intervention and control group. The child only and parent plus child intervention showed greater improvements in children's ability to solve problems and manage conflict than the parent only intervention and control group. Although all three interventions resulted in improvements in child behavior problems at one year follow-up, the greatest improvement resulted from the combined intervention. The results of this study suggest that the greatest improvements in child behavior occur when intervention targets multiple ecologies.

Forgatch, Patterson, DeGarmo, and Beldavs (2009) examined nine-year follow-up data to assess the effects of the Oregon model of parent management training (PMT-O) in reducing antisocial behavior, using a randomized control trial design. The authors hypothesized that poor parenting skills and association with deviant peers are the primary mechanisms involved in antisocial behavior. The sample included 238 mothers who had recently separated from their spouses, along with their biological son whose mean age was 7.8 years. The intervention involved 14 sessions of parent training in a group format, with a focus on monitoring, problem solving, limit setting, encouraging skills, and positive involvement. Measures included self-report questionnaires, observations of parent-child interactions, teacher reports, and arrest records. The authors found that both changes in parenting and reduced association with deviant peers had direct effects on delinquency up to nine years after intervention. The authors also noted that changes in parenting were not associated with reductions in boys' association with deviant peers and hypothesized that the effect of parenting changes on involvement with deviant peers was mediated by intervening decreases in child antisocial behavior. Therefore, it is not clear whether adding a peer intervention component would have had additive or synergistic effects. It is interesting to note that although this preventive intervention did not directly intervene in the peer ecology, there were secondary reductions in association with deviant peers. These reductions were not related to changes in parenting but were related to decreases in children's antisocial behavior resulting from improved parenting. This study provides evidence for the importance of parents and peers in the development of antisocial behavior. However, as the intervention component was only applied to parenting, this study

also suggests that it may be possible to attain beneficial indirect effects in the peer ecology by focusing instruction exclusively on parenting.

In summary, each of the preventive interventions discussed above provide some evidence of the importance of a parent-peer model in the early development of antisocial behavior. With the exception of the Forgatch et al. (2009) study, the preventive interventions focused on providing intervention in both parenting and peer ecologies, and to children in early middle childhood. Additionally, only the study conducted by Webster-Stratton and Hammond (1997) contrasted parent-only, peer-only and combined parent and peer intervention components. The methodology of each of these studies was strong in that observational data were used in addition to self-report or interview measures. Given the effects of these preventive interventions in reducing displays of antisocial behavior in children, it is now important for research to examine if interventions in early childhood need to be provided in both family and peer contexts. The question is whether it is cost effective and necessary to provide both parenting and peer intervention in early childhood, or would intervention in one of these ecologies suffice in reducing childhood antisocial behavior? The success of the previous preventive interventions suggests that providing intervention in multiple contexts may be needed. However, until research has examined the additive and synergistic effects of a parent-peer model in the development of antisocial behavior in young children, researchers and clinicians cannot judge with certainty whether providing additional intervention in multiple settings will provide significantly improved outcomes over providing intervention in only one setting.

Findings from the Current Sample

The present study involved secondary data analyses of a longitudinal data set known as the School Transitions Project (STP). Using this sample, several parenting constructs and their relationship to early antisocial behavior have previously been investigated. Additionally, peer processes, such as deviancy training, rejection, and coercion have also been examined using this data set. However, parenting and peer contributions to the development of early antisocial behavior have only been examined separately in previous analyses and reports. Prior to examining hypotheses related to the present study, a brief review of previous research using the STP sample is provided. Prior studies utilizing the STP data have separately examined several parenting and peer constructs and their relationship to the development and growth of antisocial behavior in young children.

Snyder, Cramer, Afrank, and Patterson (2005) examined the impact of ineffective discipline and hostile parent attributions about the child's behavior on the growth of antisocial behavior from kindergarten to first grade in both the home and school environment. Parent and teacher ratings, observations of children on the playground, and observed parent-child interactions were used to assess child conduct problems. Ineffective discipline techniques (i.e. threatens, scolds, derogates) were derived from observed parent-child interaction, and hostile attributions about child behavior were based on parents' responses to a series of verbal vignettes describing common discipline situations. Results supported a transactional model in which initial child conduct problems predicted ineffective discipline and hostile attributions which in turn predicted growth in child antisocial behavior in home and school settings.

In further examining the impact of parents on the development of early antisocial behavior, Patrick, Snyder, Schrepferman, and Snyder (2005) examined the relation of parental warmth, communication, and tracking to growth of conduct behavior from kindergarten to first grade, and the relation of parental warmth and communication and early conduct problems on parental monitoring in the third and fourth grade. Higher levels of parental warmth, communication, and tracking were related to fewer conduct problems at kindergarten entry. Higher levels of conduct problems at kindergarten entry were related to ineffective monitoring in third and fourth grade. Furthermore, the relationship between warmth, communication, and tracking to later monitoring was mediated by early levels of conduct disordered behavior and growth in covert conduct behavior.

Snyder, Prichard, Schrepferman, Patrick, and Stoolmiller (2003) investigated the relationship of child impulsiveness-inattention (I/I) and peer relationships to growth of conduct problems from kindergarten entry to the end of first grade. I/I was measured using multiple methods, including parent ratings, child performance on standardized tests of attention, and classroom observations. Peer relationships were measured through playground observations and peer ratings. I/I was related to growth in conduct problems as mediated by poor peer relationships for boys in both the home and school settings, and girls in the home setting only.

Research utilizing the STP sample has also investigated the contribution of peer deviancy training and association with deviant peers to growth in conduct problems from kindergarten entry to end of first grade (Snyder, Schrepferman, Oeser, Patterson, Stoolmiller, Johnson, & Snyder, 2005). Deviancy training was measured by coding verbal content during play in which the child engaged in talk and rehearsal with deviant content (about sex, drugs, alcohol,

swearing, and aggression). Deviant peer association was assessed using teacher and parent ratings. Deviancy training, deviant peer associations, and conduct problems were evident in fall of kindergarten. Growth in teacher reported conduct problems was related to growth in deviant talk and high levels of association with deviant peers. Deviancy training also predicted change in parent reports of conduct problems.

Further examination of deviant peer processes focused on the additive effects of peer coercion and deviancy training on child conduct problems at the end of third grade or beginning of fourth grade (Snyder, Schrepferman, McEachern, Barner, Johnson, & Provines, 2008). Peer coercive physical and verbal behavior and deviancy training were assessed by coding the behaviors peers directed toward a child during three one-half hour occasions of each child's interaction with same gender classmates. Peer deviancy training and peer coercion were found to be correlated but distinct processes. Conduct problems at school entry were related to peer deviancy training and peer coercion. Coercion in kindergarten was associated with overt conduct problems in third-fourth grade. Deviancy training, however, did not predict overt problems in third-fourth grade, nor did the interaction of deviancy training and coercion. Deviancy training and the interaction between coercion and deviancy training (but not coercion alone) were related to third-fourth grade covert behavior.

The current sample has also been used to demonstrate that peer deviancy training is associated with antisocial behavior and that poor parental discipline and peer rejection exacerbate the effects of peer deviancy training on later child antisocial behavior (Snyder et al, 2010). Although this study examined parenting and peer constructs in relationship to conduct

problems, it did not take a comprehensive approach to their additive and synergistic effects, and did not use multi-agent indicators to define constructs of parenting and peer processes.

Present Study

In summary, only limited research is currently available which tests an additive parent-peer model of the early development of antisocial behavior. There is an even greater paucity of research investigating the synergistic effects of parents and peers on the development of antisocial behavior in young children. This is surprising, given that antisocial behaviors are clearly evident by school entry. The present study adds to our understanding of the development of antisocial behavior by examining the additive and synergistic contribution of a full range of parenting and peer processes to the development of antisocial behavior in children first entering school. The present study also extends previous research by including female children, examining skilled as well as unskilled parenting, including deviancy training as one indicator of the peer construct, and utilizing multi-method, multi-informant measurement sources to define all constructs in the model.

The model examined the association of parenting (skilled and unskilled) with child antisocial behavior (overt and covert), as well as the association of peers (coercion, rejection, deviancy training, and deviant peer association), with growth in child antisocial behavior from school entry to the end of the second grade. Additionally, the model examined the additive and synergistic association of parenting and peer processes with child antisocial behavior. Although previous analyses of data from the STP sample have investigated various components of the parent and peer processes, the present study is unique in that it brought together all of these components into one parent-peer model in order to investigate independent and synergistic

associations. It was hypothesized that both parenting and peer processes would have direct associations with child antisocial behavior. Furthermore, it was hypothesized that the synergistic association of parent and peer processes would be apparent in the presence of the additive, direct associations.

CHAPTER 2

METHODS

Participants

Participants included 267 children at kindergarten entry, 134 boys and 133 girls. Participants' mean age was 5.3 years at the start of data collection (fall of kindergarten), with final data collection in the spring of first grade (mean age 7.2 years). Participants were a community sample, targeting for recruitment over three consecutive years all kindergarten children (along with their parents) enrolling in one elementary school in a low socioeconomic status neighborhood. Informed parental consent and child assent was obtained for 76% of the total pool of potential participants. Participants were reimbursed \$10 an hour for participation. Twenty-eight percent of families lived below the poverty threshold, and the median per capita family income (in 1998 dollars) was \$8,300. Ethnicity of participants was as follows: 71% European American, 19% African American, 5% Hispanic/Latino, 3% Native American, and 2% Asian American. Thirty-four percent of parents had completed some education beyond high school, 46% had completed high school, and 20% had not completed high school. At the beginning of data collection, 43% of children lived with two biological parents, with the remaining children living in blended families, single parent families, or with other family members.

Procedures for Parenting Measures

During kindergarten, videotaped samples of parent-child interactions, lasting two hours each, were collected on each of two occasions. The interactions occurred in a room with a one-way mirror, and contained a variety of games and materials. The structured tasks used to

organize the interaction included the following activities: problem solving a parent- and a child-identified problem, free play, planning a fun activity, practicing academic tasks, reviewing the child's school day, having a snack, picking-up toys, and reading. The interactions were coded using the Family Peer Process code (FPP; Stubbs, Crosby, Forgatch, & Capaldi, 1998) and the Specific Affect Coding System (SPAFF; Gottman, McCoy, Coan, & Collier, 1996). Both of these coding systems provide global ratings of a variety of parenting behaviors by the coder every 15 minutes, and observed rates per minute (RPM) of moment to moment changes in observed parent behavior. The FPP codes social behaviors directed toward the child by the parent into 24 mutually exclusive and exhaustive categories. The SPAFF codes parents' emotional displays during ongoing parent-child interaction into 19 mutually exclusive and exhaustive categories. All coders were trained to 80% agreement, with weekly feedback and recalibration. Two observers coded 10% of the interactions to estimate inter-coder reliability. The various measures derived from the FPP and SPAFF coding and rating were used to define constructs in the hypothesized parent-peer model of antisocial development.

During the kindergarten year, parents also completed a parent social information processing assessment (P-SIPI) in a face-to-face interview. In the P-SIPI, parents were presented with eight verbal vignettes describing common childhood misbehaviors, and asked to verbally respond to the following questions: (1) Tell me what happened in this situation? and (2) Why did the behavior occur? Assessors recorded parent responses verbatim. Parents also completed Likert-scale ratings of the degree to which they evaluated harsh discipline tactics as effective responses to these child behaviors on a scale from 1 (very ineffective) to 5 (highly effective). For example, if presented with a scenario in which a child refused to eat a disliked food for dinner

and in which the parent responded by stating the child could eat or go hungry in response to food refusal, parents were asked to rate on a 1-5 scale the degree to which they supported this response.

Parenting Measures

Parent Skilled Teaching. (See Table 1 for parenting measures). Parent skilled teaching includes the following six rating items completed by coders: consistent approach, approach included positive reinforcement, parent only provided as much assistance as the child required, parent did the task for the child (reverse scored), parent motivated child by threatening punishment (reverse scored), and parent's approach included using a lot of directives (reverse scored). Alpha for these items across sessions for FPP and SPAFF coders ranged from .59 to .72.

Parent Skilled Discipline. Parent skilled discipline includes the following seven rating items completed by coders: parent reasons with child, parent redirects child's attention, use of time-out or other non-coercive punishment, parent praises and rewards child for positive behavior, parent offers acceptable alternatives, parent uses touch to redirect the child, and parent was firm and used an evenhanded approach. Alphas for these items across sessions for FPP and SPAFF coders ranged from .55 to .79.

Positive Parenting. Positive parenting includes the following four rating items completed by coders: parent was attentive and focused, parent was respectful and caring, parent was happy and excited, and parent was affectionate and warm. Alphas for these items across sessions for FPP and SPAFF coders ranged from .65 to .86.

Parent Tracking. Parent tracking includes the following five rating items completed by coders: parent was attentive and focused, parent's attention was consistent, parent was

attached to the child, parent was cold or distant (reverse scored), and parent was disengaged (reverse scored). Alphas for these items across sessions for FPP and SPAFF coders ranged from .82 to .91. Additionally, parent responses to P-SIP questions were coded to determine two aspects of parent social information processing. The first assessed parent's accuracy in identifying important information regarding child misbehavior described in the vignettes (cue detection), and was scored a 3 if the answer was fully relevant, a 2 if the answer was partially relevant, and a 1 when the parent did not identify any relevant information. The second assessed the parents' attribution about the child behavior described in the vignettes as either hostile or benign. Coder agreement for cue detection and attributions was .67 and .69, respectively.

Parent Positive Emotion. Parent positive emotion was assessed by calculating the observed rate per minute at which the parent showed joy, humor, validation, interest and enthusiasm during parent child interaction, as coded in SPAFF. The intra-class correlation of the rpm of observed parent positive emotion displays across coders (coder reliability) was .77.

Parent Positive Interaction. Parent positive interaction was defined by observed rate per minute of the following parent behavior categories as observed and coded in the FPP: positive talk, positive interpersonal interactions, endearment, parent agrees with child, positive nonverbal displays, and parent uses touch to redirect the child. Alphas across coding categories for the two sessions were .62 and .53, respectively. The intra-class correlation of the rpm of observed parent positive interaction across coders (coder reliability) was .73.

Parent Harsh Discipline. The Parent Harsh Discipline measure includes the following seven rating items completed by FPP and SPAFF coders: parent reliance on negative affect; parent use

of ridicule and sarcasm; parent grabs, hits, or pinches child; parent threatens negative consequences; parent is erratic or inconsistent; and parent is overly strict. The intra-class correlation of the ratings of parent harsh discipline across coders (coder reliability) was .81. Alphas for the harsh discipline items across sessions for FPP and SPAFF coders ranged from .77 to .81. Parental use of harsh discipline was also measured by parents' Likert ratings of the effectiveness of harsh discipline tactics from the P-SIPI vignettes. The alpha for parent ratings across vignettes was .66.

Parent Nattering and Abusive Behavior. Parent nattering and abusive behavior was derived by calculating the rate per minute at which parents were observed to direct aversive behavior toward their child. Aversive behavior was defined by the following FPP coding categories: verbal attack, coercion, negative nonverbal behavior, physical aggression, and physical attack. The intra-class correlation of the rpm of observed parent nattering and abusive behavior across coders (coder reliability) was .87.

Negative Reinforcement. An odds ratio was calculated from observed parent-child interactions using the FPP to estimate the probability with which the parent gave in to the child aversive behavior during conflict or discipline episodes. This parental response indicates parental negative reinforcement of child aversive behavior.

Parent Anger. Parent anger was assessed by calculating the observed rate per minute at which the parent directed anger and contempt at their child, as coded using SPAFF. Coder agreement on parental anger and contempt was 83% ($\kappa = .73$).

Procedures for Peer Measures

Children were videotaped interacting with same gender classmates on three different occasions during the kindergarten year, for a total of 1.5 hours. Target children and two same gender classmates were brought to a room and asked to engage first in 15 minutes of interactive games, and then in 15 minutes of free play. Coders used the Family and Peer Process Code (described above, FPP; Stubbs, Crosby, Forgatch, & Capaldi, 1998) to code target child-peer interactions. All coders were trained to 80% agreement, with weekly feedback and recalibration.

The video-taped observations of peer interactions were also coded using the Antisocial Content Code (ACC; Oeser & Schrepferman, 2002.) The ACC provides coding of talk and play with deviant content, including the following: sex, defying authority figures, alcohol and tobacco, swearing and aggression, and cheating or stealing. The ACC also provides coding of responses by peers to the child's talk and play with deviant content. Responses are coded dichotomously as positive (positive attention) or as not positive (disapproval, ignoring, telling adults). Additionally, every 15 minutes coders rated the degree to which children were exposed to peers' talk and play with deviant content and to positive reinforcement of such talk and play.

Peer Measures

Coercion by Peers. (See Table 1 for peer measures). The first variable defining peer coercion of the target child was the rate per minute of six FPP coding categories defining aversive behavior directed by peers toward the target child. These codes were: negative interpersonal behavior (e.g. teasing), negative nonverbal (i.e. gestures), coerce, verbal aggression, physical aggression (e.g. pushing), and physical attack (e.g. hitting). Coder percent

agreement ranged from 76% to 82%. Coders also completed ratings after every 15 minutes of observation, and two of these rating items defined second and third variables for peer coercion: the degree to which the target child was “scapegoated” and “accused of wrongdoing” by peers using a Likert-scale of one to four. Coder agreement for these two items was .72 and .76, respectively.

Rejection by Peers. Classmates completed peer nominations in the fall of kindergarten of children they “liked” and “disliked” (Asher, Singleton, Tinsley, & Hymel, 1979.) The number of “like” and “dislike” nominations received by each child were summed and standardized by classroom. The standardized scores for liking were subtracted from the standardized scores for disliking to derive a peer rejection score for each child.

Association with Deviant Peers. Parents completed the CBCL (Achenback & Rescorla, 2001) and teachers completed the TRF (Achenback & Rescorla, 2001), described in detail below. Association with deviant peers was derived by taking the mean of the externalizing scale of the TRF and CBCL of the three peers nominated by the target child as his/her best friends in the fall of kindergarten.

Deviancy Training. The construct for peer deviancy training was derived by averaging two variables derived from coding child-peer interaction using the Antisocial Content Code (ACC; Oeser & Schrepferman, 2002) across all observation occasions. The first indicator was the odds ratio of peers’ positive responses to the deviant talk/play relative to normative talk/play of target children as an index of peer positive reinforcement of such talk. The second indicator was the mean of coders’ ratings of the degree to which the target child was exposed to peers’ deviant talk/play and positive reinforcement of that deviant talk/play during peer-child

interaction. The percent agreement between coders for the occurrence/nonoccurrence of deviant talk/play was 91.2%. Coder's ratings of exposure to peer deviant talk/play and its reinforcement had an intra-class correlation of .76.

Procedures for Measure of Child Antisocial Behavior

Parents completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) in fall and spring of kindergarten and first grade. Teachers completed the Teacher Report Form (TRF; Achenbach & Rescorla, 2001) in fall and spring of kindergarten and first grade.

Children were observed on the playground on four to six occasions each during fall and spring of kindergarten and first grade. During each observation occasion, the target child was observed for 5 minutes, and the child's behavior was coded using an adaptation of the playground coding system by Weiss, Dodge, Bates, and Pettit (1992). In this system, the target child's behavior was coded every 10 seconds into one of seven mutually exclusive and exhaustive categories as follows: physical and verbal aggression, positive interaction, rough play, solitary play, parallel play, solitary unfocused activity, and other. Rate per minute of physical aggression toward peers was used as an indicator of the target child's overt antisocial behavior. The intra-class correlation for rate per minute physical aggression was .92 for coder pairs. Coders made global ratings of the child's conduct problems at the end of each 5 minute observation period using a 5-point Likert-scale. One item, "The child engaged in sneaky behavior," was used to assess covert conduct problems, with an intra-class correlation across coders of .73.

Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). (See Table 1 for child antisocial measures). The CBCL is a well-validated, normed parent report rating scale of child

behavior problems. Parents rated child behavior occurring over the previous six months. Parents rated child problem behaviors on a Likert-scale from 0 (not true) to 2 (very true or often true). The CBCL yields several scales; the subscales of Rule-Breaking Behavior and Aggressive Behavior were used to define antisocial behavior, providing a total of 35 items. Examples of aggressive items include, “breaks rules”, “argues a lot”, and “gets in fights.” Examples of rule-breaking items include, “lies”, “steals”, and “cheats.” Internal reliability for each of the four assessment points was greater than .90.

Teacher Report Form (TRF; Achenbach & Rescorla, 1991). The TRF is a well-validated, normed teacher report rating scale of child behavior problems. Teachers rated child behavior occurring during the previous two months. Different teachers completed the report form in kindergarten and first grade. Teachers rated child problem behaviors on a Likert-scale from 0 (not true) to 2 (very true or often true). The TRF provides several scales; the subscales of Rule-Breaking Behavior and Aggressive Behavior were used to define antisocial behavior, providing a total of 32 items. Sample aggressive items include “argues,” “is cruel/bullies,” and “disobeys.” Examples of rule-breaking items include, “lies”, “steals”, and “cheats.” Internal reliability for each of the assessment points was greater than .93.

Child Antisocial Behavior on Playground. The rate per minute of target child physical aggression toward peers, and the observer global ratings of target child covert behavior (engages in sneaky behavior) were used to measure child antisocial behavior on the playground, using the adapted Weiss et al. (1992) coding system.

Social Competency. Social competency was assessed using the Walker-McConnell Scale of Social Competence and School Adjustment (Walker & McConnell, 1988). Using this measure,

teachers rated the target child's social behavior in 43 likert scale items ranging from 1 (Never) to 5 (frequently). Two subscales from the Walker-McConnell were used in the present study. The Peer Relations subscale is comprised of 16 items, and includes statements such as, "relates well to opposite sex," "shares laughter with peers," and "cooperates with peers." The School Adjustment subscale is comprised of 15 items and measures behavioral competencies in the classroom. Examples of items on the School Adjustment subscale include, "has good work habits," "does seatwork assignments as directed," and "listens while others are speaking." Alpha's range from .89 to .98 for each of the subscales.

CHAPTER 3

RESULTS

Preliminary Analyses and Construct Building

Descriptive statistics were calculated for each of the composite measures (Table 2). Variables were assessed for skewness and kurtosis, and none were significantly skewed or kurtotic. All variables met the assumptions of normality. There was significant variability (as indicated by the standard deviations) for the indicators for each of the composite constructs. Development of constructs proceeded in two phases. First, correlations among the measures of each construct were examined, when appropriate. Second, a series of $n=1$ forced factor analyses were conducted in order to determine if each of the potential measures or indicators of each construct (parent, peer, and child antisocial behavior) could be combined to create reliable constructs, based on a priori theory that each of the indicators should load reliably on its respective construct. Each measure was first standardized by creating z-scores.

Correlations among the measures potentially defining the parenting construct (Table 3) ranged from a low of .13 to .71. The correlations among the parenting measures were consistently reliable with the exception of natter and tracking. Each of the factor loadings of the indicators for the a priori parenting construct (Table 4) had loadings that were equal to or greater than .36, with the exception of the parenting variables “natter” and “tracking” which did not load on the parenting construct. Natter and tracking were not used to define the parenting construct in the subsequent analyses, resulting in an internally consistent, multi-method parenting construct.

Correlations among the peer measures potentially defining the peer construct (Table 5) ranged from a low of .13 to a high of .72 and showed a good deal of variability. However, the loadings of the various measures on a common peer factor were all substantial, ranging from .44 to .67 (Table 6). Thus, each measure was retained in defining an internally consistent, multi-method peer construct.

A different analytic approach was used to develop the overt and covert child antisocial constructs because of their repeated measurement at four developmental points (fall and spring of kindergarten and first grade), and because each form of antisocial behavior was defined by common measurement methods (parents, teachers, and playground observations) while retaining the a priori theoretical distinction between the overt and covert forms. The first step entailed computing a series of $n=1$ forced factor analyses for each of the three measurement methods taken one at a time (parent, teacher, and playground observation) at each developmental point (fall and spring of kindergarten and first grade) separately for the overt and covert antisocial behavior constructs. The results of this series of forced factor analyses are shown in Table 7. Each of the measures loaded in an internally consistent manner for overt and covert antisocial behavior constructs at each developmental point, with all loadings at each point greater than .41 and typically greater than .60.

The correlations among the overt and covert antisocial behavior constructs over the four developmental points are shown in Table 8. As expected, there was a good deal of cross time continuity in both overt and covert antisocial constructs. The correlations between overt and covert antisocial constructs at each developmental measurement point were also sizeable, ranging from .62 in fall first grade to .68 at fall of kindergarten and spring of first grade.

However, it should be noted that at each developmental point there was less than 50% shared variance in the overt and covert antisocial behavior constructs. These constructs are each defined by multiple methods which reduces the measurement error of each construct.

As results of the factor analyses indicated that the various measures for parenting (with two exceptions just noted) and peer processes, and for child overt and covert antisocial behavior at each developmental point created reliable constructs, structural equation modeling was used to examine the additive and synergistic effects in the parent-peer model of early childhood antisocial behavior. Prior to creating the models, each of the z-scored parent measures were summed to create a composite parent construct, and the z-scored peer measures were summed to create a composite peer construct. Descriptive statistics (Table 9) and correlations (Table 10) were then calculated for the composite parent and peer constructs. The means of zero for the composite parenting and peer construct scores reflect the sum of z-scored indicators, each with a mean of zero. More importantly, each of these constructs showed significant variance, and was not significantly skewed or kurtotic. The parenting and peer composite constructs were not highly correlated ($r = .15$), indicating that both additive and synergistic associations could be assessed without any issues of multi-collinearity.

The parent and peer constructs were again standardized and then multiplied to create the interaction term used to assess synergistic effects of parenting and peer processes. Two main effects, parenting processes and peer processes, and an interaction term representing the synergistic contribution of parenting and peer processes were assessed as predictors of growth of antisocial behavior from fall of kindergarten to spring of first grade.

SEM Tests of the Parent-Peer Model of Early Antisocial Behavior

Two structural equation models examining the hypothesized parent-peer model of the early development of overt and covert child antisocial behavior were tested using AMOS (Arbuckle & Worthke, 1999). The first model examined the additive and synergistic relationships of parenting and peer processes to the development of overt child antisocial behavior. The parenting composite was comprised of observations of skilled teaching, positive parenting, positive emotion, positive interaction, skilled discipline (all reverse scored), and of harsh discipline, parent anger, and parent negative reinforcement of child aversive behavior. The peer construct was comprised of peer coercion, peer rejection, peer deviancy training, and association with deviant peers. The intercept (mean level) of overt antisocial behavior (composite of teacher report of overt antisocial behavior, parent report of overt antisocial behavior, and playground observed rpm aggressive behavior) was set at the midpoint of the fall kindergarten (age 5.3 years) to spring first grade (age 7.2 years) developmental interval, and change in overt conduct problems was estimated as linear over time (Figure 1). The model fit the data well, $\chi^2_{(10)} = 20.73$, $p = .02$, $\chi^2/df = 2.07$, CFI = .98.

The mean of chronic level child overt antisocial behavior across the four assessment probes from fall of kindergarten to spring of first grade was significantly different than 0 (C.R. = 63.63, $p < .001$), but the mean slope was not significant (C.R. = -0.81, n.s.), indicating no average level of change in overt conduct problems over time. There was significant between-child variance in both the chronic mean levels of overt antisocial behavior (C.R. = 15.44, $p < .001$), and in the slope of overt antisocial behavior (C.R. = 2.22, $p < .05$), indicating reliable individual differences in overt antisocial behavior and in change in that behavior over time. The parenting and peer

process composite constructs were modestly correlated ($r = .16, p < .05$) as was the parenting X peer interaction term with parenting processes ($r = -.14, p < .05$) and peer processes ($r = -.17, p < .05$) composites.

The ineffective parenting construct and the deviant peer constructs each significantly predicted the intercept or chronic levels of overt antisocial behavior, $b = .21, p < .001, b = .56, p < .001$, respectively. The interaction between ineffective parenting and deviant peers did not significantly predict the intercept of overt antisocial behavior, $b = -.01, p = .92$. The ineffective parenting construct significantly predicted growth in overt antisocial behavior (slope), $b = .54, p < .05$. The deviant peer construct was not a reliable predictor of growth in overt antisocial behavior. The interaction between the parenting and peer constructs was not related to growth in overt antisocial behavior, $b = .17, p = .29$. The parent and peer model accounted for 39% of the variance in chronic levels of child overt antisocial behavior during kindergarten and first grade, and for 33% of the variance in growth of overt antisocial behavior during that 21 month period. Deviant peer processes relative to ineffective parenting processes were stronger predictors of chronic levels of child overt antisocial behavior during kindergarten and first grade (C.R. = 3.98, $p < .001$), but the parenting processes relative to peer processes were stronger predictors of growth in child overt antisocial behavior (C.R. = 3.31, $p < .001$).

The additive and synergistic parent-peer model of the development of covert antisocial behavior is shown in Figure 2. The parenting and peer composites were composed of the same variables as in the model for overt antisocial behavior. The child covert antisocial construct was comprised of parent and teacher reports of covert child antisocial behavior, and of observer ratings of child sneaky behavior on the playground. As with the model for overt antisocial

behavior, the intercept for child covert antisocial behavior was set at the midpoint between fall kindergarten and spring first grade, reflecting chronic levels of covert antisocial behavior from fall of kindergarten through spring of first grade. The slope was modeled to be linear in form.

The model fit the data well, $\chi^2_{(10)} = 21.7, p = .02, \chi^2/df = 2.17, CFI = .98$.

The chronic level of child covert antisocial behavior across the four assessment probes from fall of kindergarten to spring of first grade was significantly different than 0 (C.R. = 29.2, $p < .001$), and the mean slope was reliable and positive (C.R. = 3.18, $p < .01$) indicating average level increases in child covert conduct problems over time. There was significant between-child variance in both the chronic level of covert antisocial behavior (C.R. = 4.11, $p < .001$), and in the slope of covert antisocial behavior (C.R. = 2.34, $p < .05$), indicating reliable individual differences in chronic levels of covert antisocial behavior from fall kindergarten to spring first grade, and in change in that behavior over time. The correlations among the parenting process composite, the peer process composite, and the interaction of parenting and peer processes were modest in size and significant, and the same as in the model for overt antisocial behavior, as expected.

The ineffective parenting processes construct and the deviant peer processes constructs significantly predicted kindergarten and first grade chronic levels of covert antisocial behavior, $b = .25, p < .001, b = .65, p < .001$, respectively. The interaction of parenting and peer processes did not significantly predict chronic levels of covert antisocial behavior, $b = .06, p = .27$. The ineffective parenting processes construct significantly predicted growth in covert antisocial behavior (slope), $b = .74, p = .004$. The deviant peer construct did not significantly predict growth in covert antisocial behavior, $b = -.23, p = .37$, nor did the interaction term representing the conjoint contribution of parenting and peer processes, $b = -.13, p = .60$. The parent and peer

model accounted for 53% of the variance in mean levels of child covert antisocial behavior during kindergarten and first grade, and for 58% of the variance in growth of covert antisocial behavior during that 21 month period. Deviant peer processes relative to ineffective parenting processes were stronger predictors of mean levels of child covert antisocial behavior during kindergarten and first grade (C.R. = 4.55, $p < .001$), but parenting processes relative to peer processes were stronger predictors of growth in child covert antisocial behavior (C.R. = 2.51, $p < .01$).

CHAPTER 4

DISCUSSION

The present study assessed the influence of both parents and peers on the development of early childhood antisocial behavior. Parents play an extremely important role by socializing children during early and middle childhood, and theoretical models examining the development and growth of antisocial behavior place a strong emphasis on parenting processes (Dodge et al., 2008; Patterson et al., in press; Reid & Eddy, 1997). However, children also have increasing contact with peers as they enter elementary school and, as such, theoretical models have suggested that peers have an increasing influence on the growth of antisocial behavior once children begin socializing with peers during the school years (Dodge et al., 2008; Patterson et al., in press; Reid & Eddy, 1997). Given societal changes which create households in which both parents work, children are increasingly likely to come into contact with peers prior to entering kindergarten through settings such as child care and preschool, and may spend increasing time with peers in the absence of immediate adult supervision. This suggests that peers may also play a powerful role during early to middle childhood, prior to adolescence during which the powerful effects of peer influence have primarily been studied.

Several preventive interventions which include both a parent and peer component have been formulated and successful in reducing risk for the development of child antisocial behavior during the preschool and early elementary school years (Boisjoli et al., 2007; Eddy et al., 2000; The Conduct Problems Prevention Research Group, 2001; Webster-Stratton & Hammond, 1997). However, the need to intervene in both home/parenting and peer ecologies has not been well tested in terms of their additive and synergistic contributions to risk for early

antisocial behavior. Based on previous longitudinal and intervention research (Boisjoli et al., 2007; Dishion et al., 2004; Eddy et al., 2000; Ingoldsby et al., 2003; Petit et al., 1997; Snyder et al., 1986; The Conduct Problems Prevention Research Group, 2001; Webster-Stratton & Hammond, 1997), the present study tested the hypothesis that parenting and peer processes would contribute to the development and growth of early antisocial behavior in an additive and synergistic fashion. The hypothesis was partially supported.

Previous research with this (Snyder, McEachern, Schrepferman, Zettle, Johnson, Swink, & McAlpine, 2006) and other samples suggest that overt and covert antisocial behaviors are different in topography and social function. Overt antisocial behavior, such as aggression, is used to directly coerce others and is maintained by negative reinforcement contingencies. Overt antisocial behavior is easily identified by adults as well as peers and thus subject to adult contingencies. Other research also suggests that overt antisocial and aggressive behavior develops and occurs at high frequencies during early childhood and normatively begins to stabilize and decline during the early elementary school years (Tremblay, 2000). In contrast, covert antisocial behavior is more indirect and surreptitious in nature, making it difficult to discern by others. It is maintained by obtaining materials and status without effort (positive reinforcement) while simultaneously avoiding surveillance and punishment (negative reinforcement) for misbehavior. In contrast to overt antisocial behavior, covert acts such as lying, cheating, and stealing begin to appear during childhood but show most rapid growth during adolescence. Results of the current study indicate that trajectories for overt and covert antisocial behavior during childhood are distinguishable. Analyses indicated significant individual differences in chronic levels and in change over time of both overt and covert

antisocial behavior. However, there was no average level change in overt antisocial behavior during kindergarten and first grade, but average level growth in covert antisocial behavior during kindergarten and first grade. This suggests that covert antisocial behavior is unfolding prior to adolescence, and its growth during childhood may be an important harbinger of negative behaviors in adolescence.

Past research has not typically examined the simultaneous contribution of parents and peers to the distinguishable trajectories of covert and overt antisocial behavior. With respect to overt child antisocial behavior, the results in this study indicated that both ineffective parenting and deviancy-producing peer processes contributed in an additive but not synergistic fashion to the development of antisocial behavior during childhood, but did so in somewhat distinct ways. Both ineffective parenting and deviant peer processes were related to chronic levels of covert and overt antisocial behavior, but peer processes contributed in a stronger fashion. However, only ineffective parenting processes reliably predicted individual differences in children's growth in overt and covert antisocial behavior. One interpretation is that peers more powerfully influence where children "are at" and parents more powerfully influence the direction in which children "are heading" in the development antisocial behavior. Put another way, parents set the stage for change in antisocial behavior and peers contribute to its consolidation.

These findings have direct implications for preventive and clinical interventions. The data in this study suggest that the impact of intervention on the early development and persistence of antisocial behavior is likely to be greater and perhaps require intervention that targets both parent and peer relationships as early as school entry. Because children are involved in

maladaptive peer processes, including rejection, coercion, and deviancy training as early as kindergarten entry, interventions are needed which address these processes by teaching social skills. These skills are best taught through direct contingency management, such as the Good Behavior Game. Given that covert as well as overt antisocial behavior is undergoing active development, such peer or school based interventions are likely to require more systematic tracking and monitoring of peer interaction than is typically available in open social ecologies such as the playground. Because parenting processes also contribute to growth of both overt and covert antisocial behavior, interventions which teach parents skills such as positive reinforcement, engagement, setting limits, and providing appropriate consequences are needed.

This research examined the contribution of parents and peers to the development of antisocial behavior in multiple settings, including the home (parent report), the classroom (teacher report), and on the playground with peers (observation). In fact, this suggests the acquisition and shaping of antisocial behavior occurs across multiple social contexts, each of which offer social experiences and contingencies which foster both covert and overt antisocial behavior. This multi-setting expression and social learning suggests that, to be optimally effective, intervention may also need to target social processes in multiple settings, to include parents and peers, and perhaps teachers. In fact, the somewhat different and complementary relation of parenting and peer processes to trajectory parameters (chronic levels and growth) of antisocial development suggests that multi-setting interventions are not likely to be redundant and may be particularly important in generalizing intervention benefits across social ecologies and over time.

As indicated by Webster-Stratton and Hammond (1997) it does indeed appear that interventions which target both the parent and peer ecologies will lead to greater reductions in the development of antisocial behavior than interventions targeting either ecology alone. Webster-Stratton and Hammond examined parent only, child only, and a combined parent and child intervention in treating children ages 4 to 7 with conduct problems, and found the best outcomes in improving child behavior resulted from the combined intervention. Other preventive interventions, such as the Fast Track Prevention Trial (The Conduct Problems Prevention Research Group, 2003) and Linking the Interests of Families and Teachers (Eddy, Reid, & Fetrow, 2000), both of which include a parent and teacher or peer component, have also found improvements in child aggressive behavior. Although these two studies did not compare a parent versus peer only intervention, the results from the present study suggest that these preventive interventions in which multiple ecologies are targeted are indeed needed in order to have the greatest reductions in child antisocial behaviors. These results suggest that intervention focusing on both malleable parenting and peer processes may have powerful effects, consistent with literature on the prevention of antisocial behavior during early childhood (Boisjoli et al., 2007; Eddy et al., 2000; The Conduct Problems Prevention Research Group, 2001; Webster-Stratton & Hammond, 1997). In fact, each of the composite constructs for parenting and peer processes point to a number of malleable social processes that might be targeted in intervention.

The distinction between overt and covert antisocial behavior seems important. In addition to average growth in covert antisocial behavior contrasting with no average growth in overt antisocial behavior during the developmental period targeted in this research, parenting and

peer processes also accounted for 35% more individual variance in chronic levels of covert than overt antisocial behavior, and in 75% more individual variance in the growth of covert than overt antisocial behaviors. This is a novel finding, and suggests that interventions focused on parent and peer relationship processes may have their most potent effect on those child behaviors that are most dynamic during a given developmental period. Interestingly, most empirically supported parenting and peer interventions focus primarily on overt antisocial behaviors such as aggression, noncompliance and disruptiveness because they are more prevalent, frequent, easily discerned and bothersome to others. In contrast, covert antisocial behaviors such as lying, stealing and cheating are less prevalent, frequent, seemingly victimless and by their nature harder to discern and process. The data in this study indicate that the efficacy of existing empirically supported interventions may be enhanced by more focus on covert antisocial behavior.

Previous research using this sample showed that peer coercion and peer deviancy training in kindergarten were differentially associated with later overt and covert antisocial behavior (Snyder et al., 2010). The analyses in this report, in contrast, used composite measures of parent and peer processes, aggregating across multiple and potentially distinct though correlated social relationship processes. It may be useful in future research to disaggregate both parenting and peer processes into their distinct components in order to examine in greater detail which of these processes is more or less powerfully associated with the development of antisocial behavior, and which are differentially associated with their distinct overt and covert forms. This disaggregation may lead to more efficient intervention by focusing change efforts on those specific processes that are most powerful, or may lead to tailoring

interventions to focus on those processes most strongly associated with a specific form (overt versus covert) of antisocial behavior. Disaggregation of processes may also lead to tailoring intervention to focus on the specific social ecology (home, classroom, playground) in which the antisocial behavior is predominantly displayed. Given their different phenomenology and social function, somewhat different intervention approaches may be needed to address overt and covert conduct problems.

Contrary to the hypotheses, there were no synergistic effects of parent and peer processes on the growth of either overt or covert antisocial behavior. This finding is surprising given theory which suggests that the behaviors shaped and supported in various ecologies would have reciprocal influence. It is possible that a parent-peer model of the development of early antisocial behavior would be better assessed in a transactional model which examines the impact of parenting on peers relationship processes and then the impact of peers back on parent-child relationship processes as those effects unfold over time. In fact, some preventive interventions have found cascading effects in multiple ecologies even when intervention is focused on altering one ecology, such as parent training (Forgatch et al., 2009). Epidemiological studies have noted different symptom clusters of antisocial behavior have different ages of onset, and synergistic effects of parenting and peers may depend on the developmental timing at which different symptom clusters appear.

The current study has several strengths. First, the composite constructs used in the models were derived from multiple informants and methods, reducing measurement error. These various constructs each included observational measures, reducing measurement bias. Second, adjacent constructs in the models were defined by different informants and methods, reducing

shared source variance as an alternate explanation for the observed relationships between the constructs. Third, composite constructs were defined by measures which reflect the full range of parenting (discipline, warmth, coercion, etc.) and peer (coercion, deviant peer association, rejection, deviancy training, etc.) processes, and consequently reflect those constructs in a complete and robust manner. The parenting construct was defined by measures of both skilled and unskilled parenting. Very few studies have as measures of peer processes both coercion and deviancy training; peer deviancy training processes have primarily been examined in adolescence. Fourth, these models accounted for very substantial amounts of variance (30-60%) in individual differences in early developmental trajectories of antisocial behavior and, as such, these findings are practically as well as statistically significant.

Limitations and Future Research

The current study has several limitations, including the lack of tests of separate developmental models for both girls and boys, as the sample size for each gender limited statistical power. Although prevalence studies provide evidence that both male and female children engage in antisocial behavior, less is known about how parents and peers may contribute in different ways to antisocial development of boys and girls, and whether boys and girls experience different levels of ineffective parenting and peer deviancy training. It is possible that examining gender-specific developmental models would yield different results with respect to both overt and covert antisocial behavior, and additive and synergistic effects of parents and peers. Future research should examine gender differences in these areas. Secondly, the data and analyses are derived from a passive longitudinal design, and therefore results cannot be used to infer causation. Additionally, the effects of parents and peers on the development of

antisocial behavior were followed short term, for approximately two years. Future research should examine if the parenting and peer effects found during this developmental period persist, or if the findings apply only to the developmental period from the start of kindergarten to the end of first grade. It is possible that different factors affect the development of overt and covert antisocial behavior both earlier in development than the period assessed in the current study as well as later in development. Finally, this study sampled participants from one school in one city. Therefore, findings may not generalize to samples of children from different schools and cities that may have different characteristics.

The present study adds to research regarding the development of early antisocial behavior. Even though researchers have suggested that examining the combined rather than independent effects of parenting and peer processes may be the best approach to understanding the etiology of antisocial behavior, this is one of few studies to systematically examine these processes together in one model. The present study provides evidence for separate developmental trajectories for overt and covert antisocial behavior. More specifically, the observation of mean level growth in covert antisocial behavior indicates the need for preventive interventions to target covert antisocial behavior during this early childhood developmental period. Most importantly, results from the current study support the need for interventions to target multiple ecologies, including parenting and peer processes, by school entry. These findings point to the necessity of targeting multiple peer processes, including coercion and deviancy training, much earlier than developmental theories had suggested. Given the tremendous economic burden to society resulting from antisocial behavior, the development of increasingly effective and perhaps targeted interventions are critical to

reductions in the incidence and prevalence of antisocial behavior. Results from the current study support preventive interventions that target multiple ecologies in early childhood. Such efforts may lead to reductions in incidence and prevalence, thereby reducing the economic burden of antisocial behavior to society.

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APPENDIX

TABLE 1
PARENT, PEER, AND CHILD ANTISOCIAL MEASURES

Parenting Measures

- Parent Skilled Teaching (FPP and SPAFF observations)
- Parent Skilled Discipline (FPP and SPAFF observations)
- Positive Parenting (FPP and SPAFF observations)
- Parent Tracking (FPP and SPAFF observations; P-SIP vignettes)
- Parent Positive Emotion (rpm SPAFF observations)
- Parent Positive Interaction (rpm FPP observations)
- Parent Harsh Discipline (FPP and SPAFF observations)
- Parent Natter and Abusive Behavior (rpm FPP observations)
- Parent Negative Reinforcement (odds ratio from FPP observation)
- Parent Anger (rpm SPAFF observations)

Peer Measures

- Peer Coercion (FPP observations)
- Peer Rejection (Peer nominations)
- Association with Deviant Peers (CBCL and TRF)
- Deviancy Training (ACC observations)

Child Antisocial Measures

- CBCL (Parent Report Form)
- TRF (Teacher Report Form)
- Child Antisocial Behavior on Playground (FPP observations)
- Walker-McConnell Scale of Social Competence and School Adjustment

Note: FPP = Family Peer Process Code, SPAFF = Specific Affect Coding System, P-SIP = Parent Social Information Processing Assessment; CBCL = Child Behavior Checklist (parent), TRF = Teacher Report Form.

TABLE 2

DESCRIPTIVE STATISTICS FOR PARENT, PEER, AND CHILD MEASURES

Measure	Mean	Standard Deviation	Skewness	Kurtosis
RPM parent natter	1.42	.52	.64	.37
RPM parent anger	.07	.09	2.1	5.3
Skilled parent discipline	2.57	.35	-.17	.43
Harsh parent discipline	1.42	.28	1.23	1.51
Positive parenting	3.86	.38	-.41	1.06
Parent skilled teaching	.01	.36	-.76	.84
Parent Negative Reinforcement	-.31	.63	.59	1.92
Positive Parent Interaction	.61	.30	1.05	2.29
Parent Positive Emotion	.92	.51	1.36	3.3
Parent Tracking	2.08	.49	-.04	-.69
RPM Peer TAB to child	.39	.19	1.19	1.79
Fall K peer sociometric	-.01	1.69	.07	-.50
Spring K peer sociometric	-.01	1.69	-.17	-.82
W-M teacher preferred FK	59.13	13.69	-.30	-.79
W-M peer preferred FK	64.48	13.63	-.42	-.41
Self-reported friends z score	.00	.95	.63	-.01
TRF/CBCL deviant peers	-.01	.97	.80	.05
FK CBCL Covert AS	.18	.16	1.3	1.9

TABLE 2 (continued)

Measure	Mean	Standard Deviation	Skewness	Kurtosis
FK CBCL Overt AS	.49	.31	.89	.71
SK CBCL Covert AS	.18	.18	1.89	4.52
SK CBCL Overt AS	.48	.32	.75	.28
F1st CBCL Covert AS	.16	.18	2.5	8.9
F1st CBCL Overt AS	.42	.34	1.0	.73
S1st CBCL Covert AS	.18	.20	2.16	6.8
S1st CBCL Overt AS	.45	.33	.84	.09
FK TRF Covert AS	.09	.17	2.53	6.73
FK TRF Overt AS	.22	.31	2.0	4.78
SK TRF Covert AS	.16	.23	2.15	6.0
SK TRF Overt AS	.27	.35	1.75	3.18
F1st TRF Covert AS	.13	.19	1.84	3.34
F1st TRF Overt AS	.27	.36	1.86	3.9
S1st TRF Covert AS	.17	.24	1.69	2.57
S1st TRF Overt AS	.32	.40	1.61	2.12
Playground Obs aggression Fall K	.59	.49	1.79	4.22
Playground Obs aggression Spring K	.63	.47	1.3	2.8
Playground Obs aggression Fall 1st	.59	.57	2.06	6.08
Playground Obs aggression Spring 1st	.62	.61	2.62	11.75

TABLE 2 (Continued)

Measure	Mean	Standard Deviation	Skewness	Kurtosis
Playground Sneaky FK	1.48	.46	1.48	2.70
Playground Sneaky SK	1.55	.53	1.24	1.45
Playground Sneaky F1	1.52	.59	1.35	1.40
Playground Sneaky S1	1.52	.60	1.61	3.18

Note: K = kindergarten, FK = fall of kindergarten, SK = spring kindergarten, F1st = fall first grade, S1st = spring first grade; CBCL = Child Behavior Checklist (parent), TRF = teacher report form, Obs = observed, AS = antisocial, WM = Walker McConnell scale, TAB = total aversive behavior

TABLE 3

CORRELATIONS AMONG PARENTING MEASURES

	Skilled Teaching	Positive Parenting	Tracking	Positive Emotion	Positive Interaction	Skilled discipline	Harsh discipline	Parent Natter	Parent Anger	Negative Reinforce
Skilled Teaching	1.0									
Positive Parenting	.66**	1.0								
Tracking	.02	.02	1							
Positive Emotion	.30**	.43**	.07	1						
Positive Interaction	.38**	.50**	.08	.31**	1					
Skilled discipline	.60**	.71**	.01	.23**	.38**	1				
Harsh discipline	.60**	.62**	.02	.18**	.20**	.64**	1			
Parent Natter	.11	-.01	-.06	-.02	-.44**	-.05	.19**	1		
Parent Anger	.40**	.31**	.04	.12	.05	.37**	.50**	.15*	1	
Negative Reinforce	.24**	.22**	.13*	.19**	.08	.17*	.22**	.07	.23**	1

**Correlation is significant at the .01 level *Correlation is significant at the .05 level

TABLE 4
Factor Loadings for the Parent Construct

Measure	Factor Loading
Effective Discipline Reverse Scored	.82
Skilled Teaching Reverse Scored	.82
Positive Parenting Reverse Scored	.88
Tracking Reverse Scored	.08
Parent Positive Interaction Reverse Scored	.53
Parent Positive Emotion Reverse Scored	.47
Harsh/Ineffective Discipline	.79
Rate Per Minute Parent Natter	.02
Rate Per Minute Parent Anger	.55
Parent Negative Reinforce Child Aversive	.36

TABLE 5
CORRELATIONS AMONG THE PEER MEASURES

	Exposure to talk	Reinforce talk	Selfreport friends	TRF/CBC friends	WM teacher	WM peer	Peer Nom	TAB to child
Exposure to talk	1							
Reinforce talk	.40**	1						
Self report friends	.16*	.27**	1					
TRF/CBC friends	.30*	.30**	.45**	1				
WM teacher	.04	.08	.21**	.29**	1			
WM peer	-.06	.10	.19**	.06	.72**	1		
Peer Nom	.11	.13*	.08	.25**	.40**	.34**	1	
TAB to child	.23**	.48**	.09	.10	.08	.04	.18*	1

**Correlation is significant at the .01 level *Correlation is significant at the .05 level

TABLE 6
Factor Loadings for the Peer Construct

Measure	Factor Loading
Child Exposure to Deviant Talk/Reinforcement	.44
Child Reinforcement for Deviant Talk	.59
Self Reported Friends	.55
Association with Deviant Peers/CBCL TRF	.63
WM Peer Preferred FK	.57
WM Teacher Preferred FK	.67
Peer Nominations	.57
RPM Peer TAB to child	.44

TABLE 7
 Factor Loadings for the Overt and Covert Antisocial Behavior
 Constructs at Each Development Point

Measure	Fall K	Spring K	Fall 1 st	Spring 1 st
Overt Antisocial Behavior				
Parent CBCL	.65	.60	.65	.81
Teacher TRF	.85	.73	.82	.81
Observations	.70	.70	.54	.41
Covert Antisocial Behavior				
Parent CBCL	.56	.49	.50	.64
Teacher TRF	.82	.73	.81	.77
Observations	.80	.77	.75	.64

Note: CBCL = Child Behavior Checklist (parent); TRF = Teacher Report Form; K = Kindergarten, 1st = first grade

Table 8
Correlations Among Covert and Covert Antisocial Behavior Constructs
In Fall and Spring of Kindergarten and First Grade

Construct/ Dev. Point	1.	2.	3.	4.	5.	6.	7.	8.
1. Overt – Fall K	1.00							
2. Overt – Spring K	.63*							
3. Overt – Fall 1 st	.60*	.63*						
4. Overt – Spring 1 st	.54*	.68*	.77*					
5. Covert – Fall K	.68*	.52*	.44*	.43*				
6. Covert – Spring K	.55*	.67*	.55*	.53*	.62*			
7. Covert – Fall 1 st	.36*	.54*	.62*	.52*	.45*	.59*		
8. Covert – Spring 1 st	.40*	.52*	.52*	.68*	.49*	.62*	.62*	

*p < .001

Note: Dev. = developmental, K = Kindergarten, 1st = first grade

TABLE 9
DESCRIPTIVE STATISTICS FOR CONSTRUCTS

Construct	Mean	Standard Deviation	Skewness	Kurtosis
Parent Construct	.00	4.84	.65	1.60
Peer Construct	-.02	4.04	.41	-.08
Covert Fall K	.60	.48	1.05	.87
Covert Spring K	.75	.51	.67	.10
Covert Fall 1 st	.61	.50	.85	.23
Covert Spring 1 st	.71	.55	.77	.15
Overt Fall K	2.84	.92	.63	.16
Overt Spring K	2.83	.91	.51	.05
Overt Fall 1 st	2.70	1.02	.90	.63
Overt Spring 1 st	2.80	1.06	1.01	.62

TABLE 10

PARENT AND PEER CONSTRUCT CORRELATIONS

	Parent Construct	Peer Construct
Parent Construct	1	.15*
Peer Construct	.15*	1

*Correlation is significant at the .05 level

FIGURE 1

PARENT-PEER MODEL IN GROWTH OF OVERT ANTISOCIAL BEHAVIOR

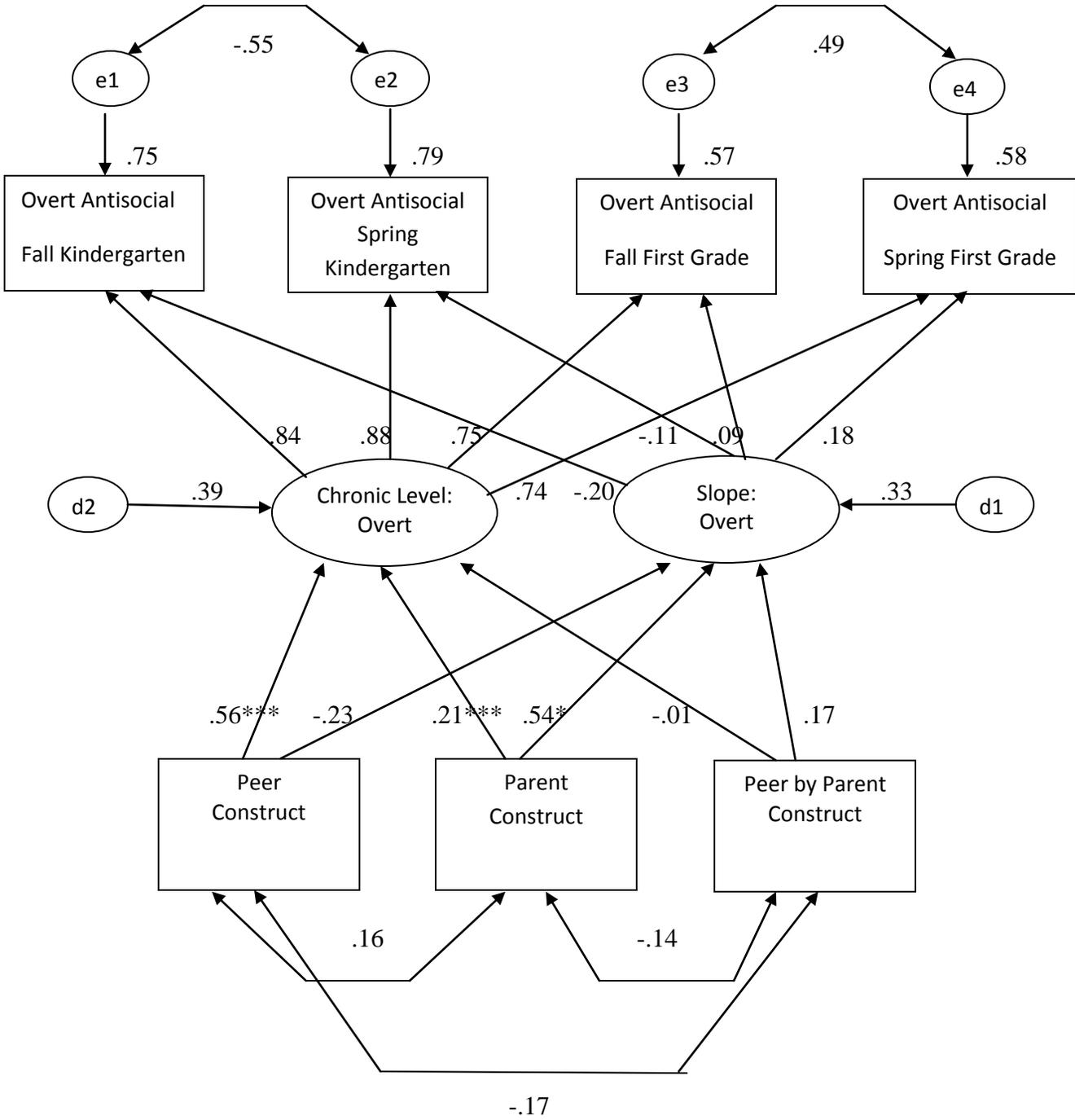
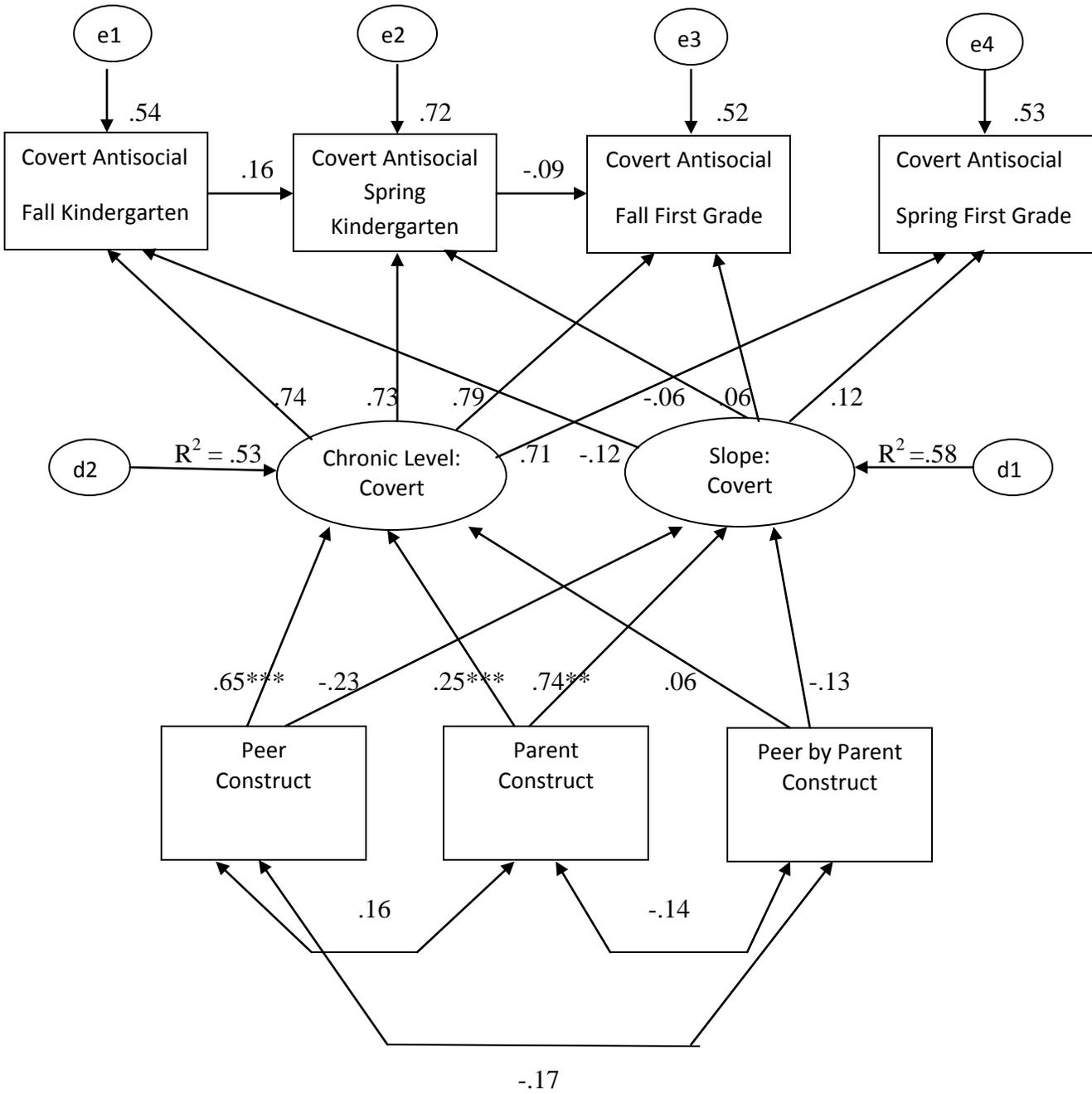


FIGURE 2

PARENT-PEER MODEL IN GROWTH OF COVERT ANTISOCIAL BEHAVIOR



p < .01; *p < .001