Research on child and adolescent conduct problems has proliferated over the past 15 years, resulting in an extensive array of risk factors, processes, and targets for intervention. To capitalize fully on this extensive research base and contribute effectively to public mental health, the field now needs to take stock of what is known about child and youth conduct problems. In 1998, The National Institute of Mental Health (NIMH) began a process known as "Taking Stock of Risk Factors for Child/Youth Externalizing Behavior Problems." "Externalizing behavior problems" refers to a range of rule-breaking behaviors and conduct problems, including physical and verbal aggression, defiance, lying, stealing, truancy, delinquency, physical cruelty, and criminal acts. The "taking stock" process involves three key objectives: (1) to identify and describe what is known about risk factors and processes that contribute to externalizing behavior problems; (2) to identify gaps in our knowledge about risk factors and processes; and (3) to describe the kinds of research and research methodologies needed to advance the field. This report provides a summary of the first of these objectives—describing what is known about existing risk factors and processes that contribute to externalizing behavior problems. This report provides a summary of expert consensus and evaluation of what is currently known about the factors and processes that contribute to the initiation, enhancement, prevention, and termination of conduct problems in children and youth. Specific information about the research studies that document these findings can be found in the accompanying tables. (Contains 285 references and 4 tables.) (GCP)
Taking Stock
of Risk Factors for Child/Youth Externalizing Behavior Problems
Taking Stock
of Risk Factors for Child/Youth
Externalizing Behavior Problems

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Introduction

Research on child and adolescent conduct problems has proliferated over the past 15 years, resulting in an extensive array of risk factors, processes, and targets for intervention. To capitalize fully on this extensive research base and contribute effectively to public mental health, the field now needs to take stock of what is known about child and youth conduct problems. In 1998, The National Institute of Mental Health (NIMH) began a process known as “Taking Stock of Risk Factors for Child/Youth Externalizing Behavior Problems.” “Externalizing behavior problems” refers to a range of rule-breaking behaviors and conduct problems, including physical and verbal aggression, defiance, lying, stealing, truancy, delinquency, physical cruelty, and criminal acts. A diagnosis of conduct disorder can be made when these conduct problems become repetitive and persistent and occur in a variety of settings, such as home, school, or community (American Psychiatric Association, 1994). The “taking stock” process involves three key objectives: (1) to identify and describe what is known about risk factors and processes that contribute to externalizing behavior problems; (2) to identify gaps in our knowledge about risk factors and processes; and (3) to describe the kinds of research and research methodologies needed to advance the field.

This report provides a summary of the first of these objectives—describing what is known about existing risk factors and processes that contribute to externalizing behavior problems. To accomplish this objective, four primary domains of risk were identified: child characteristics; family factors and processes; peer influences; the broader social environment, communities, and schools.

Within each domain, leading experts were convened in small groups (typically six to eight experts) to summarize the risk factors and processes. (A list of experts involved in these groups is included at the beginning.) Each group met for a day and a half to discuss which factors were most well-documented and “known” by the field. Through a consensus process, each small group “took stock” and identified the most well-established risk factors and processes in a given domain. To document these factors, each expert was asked to identify, evaluate, and summarize a minimum of three key references for each factor. All evaluations used a framework developed by Kraemer et al. (1997) to describe three types of risk factors. At the most basic level, factors can be correlates when shown to occur concurrently with externalizing behavior problems. Next, factors that are found to reliably precede behavior problems can be described as predictive risk factors. Finally, factors that can be manipulated through experimentation or intervention and shown to lead to changes in behavior problems can be described as causal risk factors. It is important to note that this framework also implies a “developmental course” to risk factor research. Once factors are found to be correlated with outcomes, further research should document the potential for prediction and, ultimately, the potential for causation. Causal risk factors then become the empirical foundation for building effective interventions.

This report provides a summary of expert consensus and evaluation of what is currently known about the factors and processes that contribute to the initiation, enhancement,
prevention, and termination of conduct problems in children and youth. Specific information about the research studies that document these findings can be found in the accompanying tables. Although in some cases more than or fewer than three references were evaluated, in general, the tables were limited to three entries per factor.

It is important to note that this summary is not intended to be a complete literature review of all factors related to externalizing behavior problems and conduct disorder. Instead, the summary provides an integrated overview of what experts in the field regard as the most well-studied factors and processes and further evaluates these factors in terms of their status as correlates, predictive risk factors, or causal risk factors. The objective of the summary is to document what is known about externalizing behavior problems and conduct disorder in order to highlight what causal risk factors are already known and can be used in interventions, as well as which factors need further research to document their potential for prediction and causation. The expert consensus and evaluation process used to develop this summary was considered a richer and more expeditious route to accomplishing this objective than a comprehensive literature review. In addition, this summary is limited to research on child and adolescent externalizing behavior problems and conduct disorder. Although there is some overlap between externalizing behavior problems and violence, the current summary is not intended as a complete review of all forms of youth aggression, violence, and antisocial behavior. Readers interested in this broader field of research are referred to recent reviews and edited volumes (Coe & Dodge, 1997; Loeber & Farrington, 1998; Stoff, Breiling, & Maser, 1997; U.S. Department of Health and Human Services, 2001).

Development of Externalizing Behavior Problems

Before reviewing the status of risk factors, it is important to consider how externalizing behavior problems change over development. In the past 20 years, several longitudinal studies have provided a picture of the changing forms of aggression and conduct problems from early childhood through adolescence (Cairns & Cairns, 1994; Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Patterson, Reid, & Dishion, 1992). Their findings converge to suggest that no single child characteristic or situation can account for the development of externalizing behavior problems. Rather, these problems result from interactions between characteristics of the child and situations within the family, peer group, school, and community. Some research suggests that there are two entry points to developing externalizing behavior problems—in early childhood and in early adolescence—with potentially different patterns of risk factors associated with each (Barrus, Lynam, Moffitt, & Silva, 1997; Hindeham, Lahey, & Hart, 1993; Moffitt, 1993). Children who exhibit persistently high levels of externalizing behavior problems early in their lives are at high risk for intensifying to lying, bullying, and fighting in middle childhood, and more serious behaviors such as cruelty to animals, vandalism, and aggressive criminal behaviors in adolescence. A significant number of these antisocial youth continue to exhibit correlated problem behaviors (e.g., drug use, precocious sexual activity) throughout adolescence and into adulthood, although the types of difficulties experienced by antisocial boys and girls tend to diverge with development.

In contrast to children with an early onset of externalizing behavior problems, some youth begin to exhibit problem behaviors during early adolescence. Their entry into conduct problems
generally occurs through associations with deviant peers. Initial data on these “late starters” suggest that much of their antisocial behavior tends to be nonaggressive and that they are more likely to desist in problem behaviors as they become older. However, other ongoing research is suggesting that some late starters may be involved in highly aggressive and problematic behaviors. Additional research is needed to fully understand the pathways and outcomes for late starters.

It is important to note that the early starter/late starter model of two developmental pathways for externalizing behavior problems is controversial. Several research groups are actively examining data to detect other potential pathways, as well as distinct developmental patterns related to child gender. However, this two-pathway model is important because it incorporates the notion that behaviors exhibited by children with conduct problems differ with development and changes in the social environment. The basic forms of externalizing behavior problems evident in early childhood, middle childhood, and adolescence are summarized below.

**Early Childhood**

Most children engage in rule-breaking and defiant behaviors during early childhood (ages 2–6); therefore, this is the stage of life at which externalizing behaviors are at their peak. During the early years, the primary manifestations of externalizing behavior problems include noncompliance, oppositional behaviors, and overt physical and verbal aggression. With developing cognitive, language, and social abilities, most children replace their aggressive problem-solving strategies with prosocial ones. A small minority of children continue to engage in high rates of externalizing behavior and exhibit these behaviors (e.g., coercive interactions with parents, hitting young peers) in home and school settings. Children who show early and persistent externalizing behavior problems and who experience additional psychiatric and academic problems (e.g., attention deficit hyperactivity disorder [ADHD]) are at highest risk for developing serious delinquency and engaging in juvenile crime in adolescence. Thus, children who, from an early age, show persistent externalizing behavior problems appear to be developing along the early onset pathway for conduct problems, failing to learn prosocial ways of interacting with others, and laying the foundation for continuing problematic behaviors.

**Middle Childhood**

With the increased cognitive and social sophistication of middle childhood (ages 7–13), children expand their repertoire of conduct problems from those that are evident to observers (i.e., overt, direct) to those that are hidden or secretive (i.e., covert, indirect, relational). Both boys and girls who are aggressive are at risk for being actively rejected and marginalized by their peers. When evaluating their social encounters, these children are often likely to attribute hostile intent to others. Although coercive family interactions may continue and escalate, processes within the peer group gain in importance in continuing the development of externalizing behavior problems.

**Adolescence**

Externalizing behavior problems can intensify during adolescence, when peer influences enhance the diversity of rule-breaking behaviors to include delinquent and antisocial behaviors (e.g., vandalism, theft, assault), substance use, and, in some cases, gang involvement and drug dealing. For many antisocial young men and women, there is a developmental acceleration into precocious
sexual activity and sexual promiscuity. Of these antisocial youth, a small proportion will intensify their aggressive behaviors and commit serious violent offenses.

Given what is known about the developmental course of externalizing behavior problems, it is clear that behaviors targeted for intervention, as well as the immediate expected outcomes from such interventions, will differ depending on the age of the children involved. Also, because externalizing behavior problems have not been found to be attributable to a single source or situation, interventions for changing these behaviors need to focus on multiple risk factors across multiple settings. Similarly, the relative contribution of individual risk factors may change with development, suggesting different targets for interventions at different ages. What are the multiple risk factors and situations that should be targeted in interventions? Are there additional developmental pathways other than the early and late starter pathways? These are questions of tremendous importance to the field, with equally important ramifications for public mental health.

To advance this research, however, it is important to review and take stock of what is known currently about the many risk factors for externalizing behavior problems and to use this information when considering which combinations and interactions of factors hold greatest promise for understanding and decreasing child and adolescent externalizing behavior problems. The sections that follow summarize what is currently known about risk factors in four domains: child characteristics; family factors and processes; peer influences; the broader social environment, communities, and schools.

References


Child Characteristics

A number of child characteristics have been shown to be associated with high levels of externalizing behavior problems. These characteristics span multiple aspects of the individual, including behavioral, emotional, and cognitive functioning; autonomic, neuroendocrine, and neurochemical systems; and prenatal conditions and genetics. The conclusion that emerges is that conduct problems likely involve difficulties in regulation across behavioral, emotional, cognitive, and biological functioning. However, the extent to which problems in regulation of one aspect of functioning (e.g., emotional) affect the ability to regulate another aspect (e.g., biological) or how development of regulation in any one affects other aspects is not known.

Behavioral and Emotional Factors

A number of behavioral and emotional characteristics have been hypothesized to play a role in externalizing behavior problems. One prospective longitudinal study found that the display of empathic, sympathetic, and prosocial behaviors in childhood predicts a lower risk of conduct problems in early adolescence (Tremblay, Style, Vitaro, & Dobkin, 1994). This work is supported by research using concurrent designs showing that children and youth with conduct problems perform more poorly on measures of empathy compared with normal children and youth (Cohen & Strayer, 1996; Eisenberg et al., 1996; Miller & Eisenberg, 1988).

Research on child emotionality has focused on two forms of early emotional/behavioral characteristics: difficult-irritable-oppositional and shy-inhibited. Several longitudinal studies have found that a pattern of difficult-irritable-oppositional behavior during early childhood predicts increased risk for later externalizing behavior problems in childhood and adolescence (Bates, Pettit, Dodge, & Ridge, 1998; Caspi, Moffitt, Newman, & Silva, 1996; Guerin, Gottfried, & Thomas, 1997). The strength of these associations typically falls in the moderate range (Cohen, 1988).

In addition, several longitudinal studies have found that a pattern of inhibited behavior during early childhood predicted decreased risk for later antisocial behavior (Raine, Reynolds, Venables, Mednick, & Farrington, 1998; Tremblay et al., 1994). However, other studies have found that behavioral inhibition in early childhood predicted either later aggression or later increased antisocial behavior (Caspi et al., 1996; Goldsmith, 1996). Clearly, more research is needed on the influence of early behavioral inhibition.

Complementing this work on emotionality is newer research examining behavioral and attentional regulation (i.e., a child’s ability to maintain calm, purposeful action and attention rather than acting in daring, impulsive, and poorly controlled ways). This research indicates that childhood daring and impulsive behaviors (i.e., lack of regulation) (Farrington & Hawkins, 1991), particularly when combined with irritable emotionality, are predictive risk factors for later adolescent antisocial behavior (Eisenberg et al., 2000). Both behavioral and
attentional regulation contribute to this finding, and the pattern of relations, while low-moderate in predictive strength, has been found in the United States (Lengua, West, & Sandler, 1998) and New Zealand (Henry, Caspi, Moffitt, & Silva, 1996).

Cognitive Factors

Research on ADHD provides further information about the role of attention and other cognitive processes in the development of externalizing behavior problems. A number of studies have documented that boys who meet criteria for ADHD in childhood are at increased risk for conduct disorder and antisocial behavior in adolescence and early adulthood (Mannuzza et al., 1991). However, when comorbid oppositional defiant behavior is measured, some evidence suggests that increased risk for conduct disorder is correlated with early oppositional defiant behavior rather than ADHD (Biederman et al., 1996; Moffitt, 1990). Thus, while the evidence indicates an association between ADHD and conduct problems, it is not clear whether ADHD operates as a predictive risk factor or a moderator.

In trying to clarify the implications of ADHD, researchers are incorporating indices of basic cognitive functioning and development, specifically executive function and inhibitory control processes. Executive function refers to the ability to take in information, formulate plans of action and thinking, and execute behaviors consistent with these plans. Involved in this process is the ability to exert inhibitory control, that is, to inhibit other sources of information and other incompatible behaviors.

There is some debate as to whether executive function and inhibitory control are relevant to conduct disorder or whether they are best thought of as related to ADHD and, therefore, pertinent only in instances of comorbid conduct disorder and ADHD. However, recent studies using improved measures of these cognitive processes and refined sampling techniques have indicated that inhibitory control is correlated with conduct disorder, even in the absence of ADHD (Oosterlaan, Logan, & Sergeant, 1998; Oosterlaan & Sergeant, 1996). Children with more persistent or pervasive conduct problems seem more likely to demonstrate deficits in executive function and inhibitory control. These associations appear to be relatively independent of IQ and other cognitive functions, such as memory (Seguin, Boulerice, Harden, Tremblay, & Pihl, 1999). This independence of effect from IQ is particularly important because a large number of studies have found lower IQ and verbal abilities to be predictive risk factors for later antisocial behavior (Fergusson & Horwood, 1995; Stattin & Klackenberg-Larsson, 1993; White, Moffitt, & Silva, 1989). Note, however, that much of the research on executive function is based on concurrent assessments of cognitive functioning and problematic behavior. Additional research is needed to identify the predictive associations and potential causality of these processes for conduct problems.

Related to IQ and verbal abilities is a young person’s academic achievement. Research consistently documents low correlations between poor academic performance and externalizing behavior problems (Maguin & Loeber, 1996). Again, it has been difficult to determine if this association holds for children who show conduct problems in the absence of ADHD; several studies show correlations among poor academic achievement, conduct, and attention problems, but weak or no relationships between poor academic achievement and conduct problems alone (Frick et al., 1991). However, children who develop conduct problems in middle childhood are at increased risk of later negative educational outcomes, including early school dropout (Fergusson & Horwood, 1998). Thus, the direction of effects between academic achievement and externalizing behavior
problems may be complex and may change across development.

In contrast to research on basic cognitive functioning and academic achievement, strong evidence exists about the role of social information processing as both a predictive and a causal risk factor for externalizing behavior problems. Findings from prospective longitudinal studies (Dodge, Bates, & Pettit, 1990; Dodge, Pettit, Bates, & Valente, 1995) and intervention studies (Hudley & Graham, 1993) provide clear evidence that biased social information processing—that is, the tendency to attribute hostile intentions to others—predicts and is a causal risk factor for the development and maintenance of physically aggressive behavior patterns. Similarly, initial studies suggest that biased social information processing may be involved in the development of other forms of aggressive behavior (e.g., relational aggression) (Crick, 1995). The work on relational aggression, however, has progressed only to the extent of finding concurrent associations.

Consistent evidence also documents modest correlations between conduct problems and problems in moral reasoning and social problem solving. When faced with interpersonal conflicts or social dilemmas in an experimental situation, aggressive preschool and elementary school-aged children are more likely than their nonaggressive age-mates to recommend using aggressive, manipulative, and/or commanding strategies for resolving problems (Rubin, Bream, & Rose-Krasnor, 1991; Rubin, Moller, & Emptage, 1987). Among older youth and adults, delinquent and antisocial behavior is correlated with poorer and less sophisticated moral reasoning abilities (Gregg, Gibbs, & Basinger, 1994; Nelson, Smith, & Dodd, 1990; Trevathan & Walker, 1985). Additional research is needed to determine whether social problem solving and moral reasoning abilities predict or follow externalizing behavior problems or whether improvements in these abilities can lead to improvements in externalizing behaviors.

### Autonomic Factors

Another aspect of child functioning that has been related to emotional and behavioral regulation is the autonomic system, particularly indices of heart rate. Lowered heart rate and dampened heart rate variability are consistently correlated with disruptive and antisocial behaviors from early childhood through adolescence and adulthood (Mezzacappa et al., 1997). These autonomic measures have been found to predict later aggression in childhood (lower heart rate or vagal tone) (Raine, Venables, & Mednick, 1997), and the cessation of antisocial behavior in young adulthood (higher heart rate) (Raine, Venables, & Williams, 1995). These data, however, are limited to males, because only a few studies have examined links between heart rate and externalizing behavior problems in girls. Additional research is needed to document whether heart rate regulation indices predict the onset and persistence of diagnosed conduct disorder.

### Neuroendocrine Factors

Hormones produced by the hypothalamic-pituitary-adrenal axis appear to be related to the pathophysiology of externalizing behaviors, based on correlational studies. Basal levels of cortisol tend to correlate negatively with indices of childhood externalizing behavior (McBurnett, Pflißer, Capasso, Lahey, & Loeber, 1997; Moss, Vanyukov, & Martin, 1995). Also, there is evidence that increased cortisol reactivity (changes in level) predicts conduct problems one year later among adolescents (Susman, Dorn, Inoff-Germain, Nottelmann, & Chrousos, 1997). Additional research is needed that employs consistent methods and procedures for collecting basal cortisol and monitoring cortisol reactivity (a likely contributor to inconsistent findings in long-term longitudinal studies to determine the direction of effects.)
The hypothalamic-pituitary-gonadal axis is responsible for producing gonadotropin-releasing hormones (LHRH), the gonadotropins (luteinizing hormone and follicle stimulating hormone), and sex steroids (testosterone, estrogen, and progesterone). The findings for these hormones and sex steroids vary across ages and studies. Specifically, no single study or group of studies establishes the relationship between LHRH and gonadotropins and externalizing behavior problems. There is evidence that higher testosterone correlates with greater aggression and irritability during adolescence (Olweus, Mattsson, Schalling, & Low, 1988). In one randomized double-blind experiment with youth experiencing paternal delay, boys and girls who were administered mid-level doses of testosterone and estrogen, respectively, showed increased aggressive behavior compared with those receiving placebo (Finkelstein et al., 1997). However, developmental differences were suggested, with stronger patterns of association found between testosterone and externalizing behavior in older adolescents boys than in younger adolescents. Given the small sample size for this study, additional research is needed to clearly understand potential effects. In addition, few studies have included measurement of estrogen and other sex steroids.

**Neurochemical Factors**

In comparison to many of the other areas of influence discussed in this report, evidence for the influence of regulation of brain neurochemicals on externalizing behaviors is not as clear or abundant. Two neurochemical systems, serotonin and dopamine, have been studied. Serotonin is a regulatory neurotransmitter that can be involved in inhibitory responses to stimuli. Evidence relating the serotonergic system with externalizing behavior is derived from both animal and human studies. There is some indication that enhanced serotonergic activity in early childhood correlates with increased externalizing behavior (Halperin et al., 1997; Krues i et al., 1992; Fine et al., 1997). This statement, however, is only tentative. Few studies have been done with children and young adolescents. The studies to date have included small and unrepresentative samples. Also, this research is complicated by differences in measurement strategies across studies (cerebrospinal fluid indexes versus peripheral indexes following pharmacological challenge) that make cumulative interpretations difficult.

The empirical evidence to support the role of dopamine in externalizing behavior in humans also is not well developed. Limited studies with children provide unclear findings. Lower levels of homovanillic acid (the metabolite of dopamine) (Limson et al., 1991) and lower levels of dopamine beta-hydroxylase (DBH, the enzyme facilitating conversion of dopamine to norepinephrine) were correlated with externalizing behavior (Galvin, Silv et, & Shekher, 1997). However, a positive relationship was found between plasma DBH and disinhibition and sensation seeking (Kuperman, Kramer, & Loney, 1988). Overall, the functioning of the dopaminergic and serotonergic systems has not been sufficiently researched to draw conclusions about their contribution to externalizing behavior problems.

**Prenatal Conditions and Genetic Factors**

Several prenatal conditions associated with adverse reproductive outcomes also have been associated with externalizing behavior problems in offspring. These include young maternal age, smoking, and alcohol and drug use during pregnancy. It is important to note that this area of research is challenged by the extent and complexity of co-occurring factors (e.g., low socioeconomic status (SES)), violence in the environment, family
conflict). Sorting out these confounding factors is extremely difficult and requires caution in drawing inferences about causal relationships.

Given these difficulties, there is substantial evidence that offspring of mothers who give birth earlier in life are more likely to have externalizing behavior problems during childhood and adolescence (Christ et al., 1990; Fergusson & Lynskey, 1993; Spieker, Larson, Lewis, White, & Gilchrist, 1997). This predictive association between maternal age and child conduct problems still holds even when maternal and paternal conduct problems, substance use, perinatal factors, demographic factors, parent-child interactions, and related variables have been controlled in regression analyses (Fergusson & Lynskey, 1993; Wakschlag et al., 1997). Although it is not clear how maternal age is related to child behavior problems, at least two kinds of variables can be hypothesized as mediators. First, having a child earlier in life often restricts maternal educational and occupational attainment and related life circumstances, such as neighborhood of residence, that are associated with youth conduct problems and crime (see the Broader Social Environment, Communities, and Schools section). Second, less mature mothers may be more likely to raise their children in ways that may foster conduct problems, such as use of harsh and inconsistent discipline (see Family Factors and Processes section). Also, other as-yet-unknown biological variables, environmental variables, or both may mediate this relationship.

In addition to maternal age, consistent evidence exists that prenatal maternal smoking is a predictive risk factor for later child conduct problems. Evidence from methodologically strong epidemiological and clinical studies in several countries has found maternal cigarette smoking during pregnancy to predict inattention and impulsivity during early childhood and conduct problems and antisocial behavior during middle childhood and adolescence (Brennan, Grekin, & Mednick, 1999; Fergusson, Woodward, & Horwood, 1998; Wakschlag et al., 1997; Weissman, Warner, Wickramaratne, & Kandel, 1999). Even when potential mediators and confounds are considered (e.g., maternal age, drug use, psychopathology, SES, parent-child interactions), the findings suggest linear relationships between the number of cigarettes smoked per day and the increased predictive risk of child and adolescent conduct problems. As in the research on maternal age, the reasons why maternal smoking is related to child conduct problems are not clear. It could be that maternal smoking is a marker for some other set of risk factors (e.g., parental behavior, neighborhood effects [see respective sections on these topics]), or that prenatal exposure to nicotine affects fetal neurodevelopment, which in turn increases the child’s vulnerability to conduct problems, or that these biological and social risk factors interact in some way. Indeed, controlled animal studies consistently show that exposure to low levels of nicotine alters fetal neural development (Navarro et al., 1989). Clearly, additional research is needed to help explain why prenatal maternal smoking is a predictive risk factor for later child conduct problems.

Two other classes of prenatal insults that have been related to later child conduct problems are exposure to alcohol and exposure to illegal drugs. Although research on prenatal exposure to alcohol has shown robust effects on cognitive development and neurodevelopment (e.g., attentional and intellectual deficits) during childhood and adolescence (Coles et al., 1991), research on conduct-related behaviors among these children suggests low to modest effects (Brown et al., 1991; Coles et al., 1991; Olson et al., 1997). Similarly, research on prenatal exposure to illegal drugs (e.g., cocaine) has found subtle and modest differences in intellectual behavior and arousal regulation between exposed children and nonexposed comparison children (Eyer, Behnke, Conlon, Woods, & Wobie, 1998; Lester, LaGasse, & Seifer, 1998). A recent study found prenatally exposed
boys to show more problems with undercontrolled behavior compared with nonexposed children from similar environmental backgrounds (Delaney-Black et al., 2000). Much of this work is ongoing and has so far followed children only through middle childhood; thus, the effects on adolescent behavior are not known.

A distinct yet equally challenging area of research concerns the study of genetic contributions to externalizing behavior problems. Generally, studies in this area can be subdivided into two categories: those examining the genetics of conduct disorders and those examining the genetics of behaviors that are relevant to the development of conduct problems. These behaviors are potentially important because they typically emerge earlier than conduct problems and may be developmental precursors.

In studying the genetic influences on conduct disorder, it has become clear that accurate description and subtyping of phenotypic behaviors are essential. Research has shown that levels of genetic and environmental influence appear to differ markedly for different patterns of conduct problems (Edelbrock, Rende, Plomin, & Thompson, 1995; Silberg et al., 1995). In the early starter pattern, adolescent boys with an earlier age of onset tend to be highly oppositional, to exhibit comorbid ADHD, and to engage in physical aggression, property crimes, and truancy. In the late starter pattern, boys with onset during adolescence typically do not have ADHD and restrict their problematic behavior to property crimes and truancy. Initial research examining concordance between twins suggests that early starter conduct disorder may be more strongly influenced by genetic factors than the developmental type of conduct problems that emerges during adolescence (Silberg et al., 1995).

A number of adoption studies, however, provide evidence for more complex relationships among genetic and environmental factors. The likelihood of conduct problems in adopted-away offspring of antisocial parents (i.e., parents with criminal records) is significantly lower if they were raised by well-adjusted adoptive parents (Cadoret, Yates, Troughton, Woodworth, & Stewart, 1995). However, the ability to parent such children also may be affected in that genetically influenced characteristics of the child can evoke parenting behaviors that in turn increase the risk of developing externalizing behavior problems. Several studies of adopted offspring of antisocial parents have shown gene-environment evocative effects; adolescent externalizing behavior problems partially mediate the relationship between biological parent antisocial behavior and adoptive parent harsh/inconsistent discipline (Ge et al., 1996; O'Conner, Deater-Deckard, Fulker, Rutter, & Plomin, 1998). These results are supported by behavioral genetic studies of twins showing that the correlation between harsh parenting behavior and adolescent antisocial behavior problems is partially accounted for by variations in the adolescent's genetic background (Neiderhiser, Reiss, Hetherington, & Plomin, 1999). Thus, parenting and other environmental features appear to interact in complex ways with genetic dispositions in relation to youth conduct problems.

In addition to research on the genetic influences of conduct disorder, there has been research examining genetic influences on behaviors related to conduct disorder. Of the many childhood characteristics considered to be likely developmental precursors to serious conduct problems, two characteristics—ADHD and difficult-irritable-oppositional behavior—have been examined in a number of twin studies. Collectively, these studies indicate substantial genetic influence on attention problems and ADHD (Edelbrock et al., 1995; Gjone, Stevenson, & Sundet, 1996; Levy, Hay, McStephen, Wood, & Waldman, 1997; Snerman, McGue, & Iacono, 1997) and difficult-irritable-oppositional behavior (Cyphers, Phillips, Fulker, & Mrazek, 1990; Goldsmith, Buss, & Lemery, 1997), with heritability estimates generally
above .50. Unfortunately, most twin studies of difficult-irritable oppositional behavior have confounded its measurement with aggressive behavior. Other child characteristics relevant to conduct disorder include lowered levels of empathy and lowered levels of harm avoidance/behavioral inhibition (Cyphers et al., 1990; Emde et al., 1992; Goldsmith et al., 1997). Twin studies consistently indicate low to moderate heritability of these behaviors, as well.

It is important to note, however, that behavioral genetic studies frequently are limited by their small, nonrepresentative samples and by methodological problems associated with restriction of range. A preponderance of the studies in Table 1 used Caucasian samples, with little attention to description or variations related to SES.

Implications for Malleable Child Risk Factors and Developmental Processes

The term child factors refers to characteristics of children that increase or decrease their risk for externalizing behavior problems. Such factors frequently have not been considered candidates for demonstrating "causal" relationships because they typically are conceptualized more as static traits or "unmalleable" predispositions. Our growing knowledge about development and the tremendous interplay among biology, environment, and behavior, however, challenges this thinking and suggests that many child factors may indeed be malleable, particularly during early development. An example of this social information processing, including hostile attributional bias. Interventions targeting these processes have shown that hostile attributions are malleable and that decreasing those attributes decreases child externalizing behaviors. Additional child factors reviewed here that similarly could serve as experimental targets for preventive interventions are child empathy, moral reasoning, and social problem solving.

Even if child factors are not malleable, greater attention to these factors could be of great value to prevention research by improving the ability to focus interventions on children who are most at risk. A number of child factors reviewed here could be evaluated in terms of their usefulness as selection factors for high-risk studies, including individual differences in executive function, early academic difficulties, and early impulsivity and irritability emotionality, particularly when these characteristics co-occur with environmental risk factors.

In addition to highlighting targets for intervention, the current review indicates that additional research is needed to confirm the potential predictive risk of some child characteristics, particularly individual differences in autonomic activity, neuroendocrine factors, and neurochemical factors. Similarly, there is little to no existing information about the potential interactive effects among different child characteristics. For example, it is not known how individual differences in autonomic regulation relate to differences in cortisol regulation, emotional regulation, or both. Also, no one knows how interactions among such characteristics may vary across age groups or how family, peer, and other social environmental factors may affect these patterns. Research is needed to examine such interactions and investigate how the accumulation and interaction of child risk factors and environmental factors affects the developmental course and severity of conduct problems.

Future research on child characteristics related to conduct problems should consider two important issues. First, many potentially malleable child factors appear early in life, so researchers need to focus on an earlier part of the lifespan. Advancing such research may require collaborations between psychiatrists and developmental researchers with
an understanding of early childhood. Indeed, some findings on maternal age and maternal smoking during pregnancy suggest that research may need to focus on pregnancy and the behavior of young women that leads to early birth and child rearing; this research would require an even greater range of expertise and scientific disciplines. Second, it is vital that research testing experimental interventions targeting child factors include both males and females, as well as children from diverse ethnic backgrounds. The ratio of males with conduct problems to females with conduct problems is not as great as previously suspected. It is essential to determine whether risk factors for externalizing behavior problems in girls are the same as or distinct from those for boys and whether these factors are robust across ethnic groups.

Finally, it is important to note that there may be several opportunities for testing the potential causality of some child risk factors by partnering with intervention research on related outcomes. Current intervention trials that target maternal smoking, drug use, and alcohol use and that include long-term followup should be encouraged to examine child externalizing behavior problems. Similarly, intervention trials targeting early IQ, verbal abilities, and academic achievement should be encouraged to include assessment of externalizing behavior problems. This recommendation extends to psychiatric intervention trials focusing on the reduction of oppositional behavior and ADHD in early life. It is important to examine whether successful modification of these behaviors can reduce the incidence of conduct problems in later childhood and adolescence.

References


G. R. Bock (Ed.), *Genetics of criminal and antisocial behavior* (pp. 76–92). New York: John Wiley.


<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age*</th>
<th>% Male</th>
<th>SES**</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohen &amp; Strayer</td>
<td>1995</td>
<td>Concurrent group comparisons</td>
<td>Recruited conduct-disordered adolescents in residential treatment &amp; local high school students without conduct problems</td>
<td>62</td>
<td>14–18 yrs</td>
<td>47%</td>
<td>Low-middle “majority of parents” employed in the trades</td>
<td>N/R</td>
<td>Conduct-disordered boys &amp; girls scored lower than a comparison group of children without conduct disorder on affective &amp; cognitive measures, including measures of empathic concern &amp; perspective taking.</td>
</tr>
<tr>
<td>Eisenberg, Fates, et al.</td>
<td>1996</td>
<td>Concomitantly correlational</td>
<td>Recruited suburban grade school children, parents, &amp; teachers</td>
<td>199</td>
<td>K–3rd gr</td>
<td>51%</td>
<td>M = 90 mins (50%)</td>
<td>M = 146.5 (SD = 56)</td>
<td>79% Caucasian, 10% Hispanic, 5% Multiracial, 2% Asian</td>
</tr>
<tr>
<td>Miller &amp; Eisenberg</td>
<td>1988</td>
<td>Meta-analysis</td>
<td>22 studies, 6 aggression, picture/story empathy, 9 aggression, questionnaire, 8 externalization, questionnaire</td>
<td>N/R</td>
<td>2,065</td>
<td>6 yrs–adult</td>
<td>&gt;70%</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>Tremblay, et al.</td>
<td>1994</td>
<td>Prospective longitudinal 8 yrs</td>
<td>Boys in 53 public schools, low-SES areas, Montreal, Canada; rated by kindergarten teachers, eligible boys had Canadian-born, French-speaking parents with &lt; 15 yrs of education</td>
<td>915</td>
<td>K &gt; 13 yrs</td>
<td>100%</td>
<td>M = 82 (U.S. income: M = 50.5 yrs maternal ed)</td>
<td>100% Caucasian (French Canadian)</td>
<td>Low reward dependence (empathy/prosociality), high novelty seeking, &amp; low harm avoidance/novelty in kindergarten predicted delinquency at ages 11–13.</td>
</tr>
</tbody>
</table>

Key Statistics:
- Empathy: F (1, 60) = 29.87, p < .001
- M = 40.67 conduct disorder, 64.20 comparison
- Empathy—Affective: F (1, 60) = 18.34, p < .001
- M = 11.53 conduct disorder, 30.75 comparison
- Empathic Concern: F (1, 60) = 8.14, p < .007
- M = 24.60 conduct disorder, 28.31 comparison
- Perspective Taking: F (1, 60) = 11.08, p < .01
- M = 19.92 conduct disorder, 24.39 comparison

Baseline Distress & Behavior Problems:
- Partial r (185) = 0.19, p < .05
- Father
- Partial r (127) = 0.16, p < .05
- Mother
- Partial r (185) = 0.20, p < .006
- Teacher

Gaze Aversions & Conduct Problems:
- Partial r (178) = 0.15, p < .05
- Mother
- Partial r (127) = 0.21, p < .02
- Father
- Partial r (185) = 0.20, p < .007

Questionnaire Empathy—Aggression:
- \( z^2 (14, N = 15) = 23.72, p < .05 \)
- \( z = -1.18, z^2 = 4.96, p < .001 \)
- CI = (−1.21) (−0.55)

Questionnaire Empathy—Externalizing:
- \( z^2 (9, N = 10) = 10.27, p = ns \)
- \( z = -1.5, z^2 = 4.28, p < .001 \)
- CI = (−2.21) (−0.80)

Picture/Story Empathy—Agg (> 5 yrs old):
- \( z^2 (8, N = 9) = 7.26, p = ns, CI = (−2.40) (−0.40) \)
- \( z = -1.0, z^2 = 2.52, p < .02 \)

Delinquency:
- Goodness of fit \( z^2 (910) = 194.62, p = .54 \)
- Low reward dependence (empathy/prosociality)
- Wald's \( z^2 (1) = 4.8, p < .03 \)
- High novelty seeking
- Wald's \( z^2 (1) = 28.4, p < .0001 \)
- Low inhibition
- Wald's \( z^2 (1) = 39, p < .02 \)

* > Indicates that data at first age are used to predict data at second age.
** Unless otherwise indicated, income is reported in yearly amounts.
### Child Characteristics—Behavioral and Emotional Influences

#### Child Emotionality: Shy-inhibited and Irritable-difficult

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
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</thead>
</table>
| Sales, Pettit, et al. | 1998 | Prospective longitudinal | recruited families with infants from birth records, Bloomington, IN (BLS), & families with 5 yr olds, Bloomington, IN, Knoxville & Nashville, TN, balanced for gender, low-high aggression (COP) | 90   | 6 mos > 10 yrs | 56% BLS; 49% COP | BLS; M = 60.85 | 15% AFA | Experiencing at 7-10 yrs of age (mother & teacher ratings) was predicted by the interaction of infant's resistance to control & mother's restrictive control. 
Control to control in infancy predicted experiencing for children with mothers low in restrictive control. |
| Caspi, Moffitt, et al. | 1996 | Prospective longitudinal | prospective longitudinal, Population: consecutive births, spring 1972-1973, Dunedin, New Zealand | 961  | 3 > 21 yrs | 50% N/R | N/R | >3% Aca/C <7% Malay <7% Polyn | Undercontrolled children at age 3 were more likely than inhibited or well-adjusted children to be convicted of 2+ crimes or diagnosed with antisocial PD by age 21. Age 3 undercontrolled children & inhibited boys were more likely than well-adjusted children to be convicted of a violent offense by age 21. |
| Goldsmith, 2016 | 2.5 yrs | Prospective longitudinal | recruited from newspaper birth announcements | 49   | 18 mos > 4 yrs | N/R | Working-middle | Aggression at 4 was associated with higher activity level, social fearfulness, anger pronounced, & less tendency to express pleasure at age 4. None of the temperament measures at age 18 mos predicted aggression at age 4. |
| Guerra, Gotfrid, et al. | 2017 | Prospective longitudinal | Conveniences: nonclinical sample of 1 yr olds & their families | 104  | 1.5 > 12 yrs | 55% | Middle | 50% Aca/C | Difficulties at 1.5 yrs was associated with parent reports of problem behavior at 3.2 yrs, hostile-aggressive behavior at 3.5 yrs, externalizing at ages 4-6, 7-9, 10-12, & teacher reports of externalizing at ages 4-6. Difficulty was associated with being above the borderline of clinical cutoff for hostile-aggressive behavior at 3.5 yrs, aggressive behavior at 4-12 yrs, & externalizing at 4-12 yrs. |
### Child Characteristics—Behavioral and Emotional Influences

#### Child Emotionality: Shy-inhibited and Irritable-difficult

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<tr>
<th>Authors</th>
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<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raines, Reynolds, et al.</td>
<td>1998</td>
<td>8 yrs</td>
<td>Population: unselected births cohort, 1996; two towns in Martinas (island country in the Indian Ocean)</td>
<td>1,130</td>
<td>3 &gt; 11 yrs</td>
<td>51%</td>
<td>NR</td>
<td>&lt; 5.6% Asian &lt; 5.6% Cau</td>
<td>High aggressive children at age 11 scored higher on stimulation seeking (or lower on harm avoidance/behavioral inhibition) at age 3 than children low in aggression in analyses with gender &amp; ethnicity, SES, body size, &amp; fearlessness controlled.</td>
</tr>
</tbody>
</table>

Tremblay et al., 1994: see "Empathic, Sympathetic, and Provocational Behaviors"

#### Combined Regulation & Negative Emotionality

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population:</th>
<th>Convenience</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eisenberg, Guze, et al.</td>
<td>2000</td>
<td>2 yrs</td>
<td>recruited suburban grade-school children, parents, &amp; teachers</td>
<td>146</td>
<td>K-3rd &gt; 2-5th gr</td>
<td>50%</td>
<td>Middle</td>
<td>1% Afe</td>
<td>In the best-fitting model, the path between attentional control (att control) &amp; problem behavior at T1 &amp; T2 was moderated by children's negative emotionality (NE); lower attentional control predicted problem behaviors for children high in NE. Behavioral regulation (beh reg) predicted T1 &amp; T2 behavior problems for high or low NE children.</td>
<td></td>
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<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farrington &amp; Hawkins</td>
<td>1991</td>
<td>2 yrs</td>
<td>8-9 yrs from 6 state primary &amp; 1 special ed school in working-class area of London, 1961-1962; Cambridge Study in Delinquent Development</td>
<td>411</td>
<td>9-10 &gt; 18-19 yrs</td>
<td>100%</td>
<td>Low</td>
<td>90% Cau &lt; 10% W Ind</td>
<td>high delinquency (age 8-10), high troubledness, a convicted parent, low school attainment, delinquent older siblings, &amp; poor housing predicted convictions between ages 10 &amp; 20; taking into account high nervousness, poor parent child rearing, &amp; low commitment to family.</td>
<td></td>
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<thead>
<tr>
<th>Authors</th>
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<th>Design</th>
<th>Population:</th>
<th>Convenience:</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry, Capp, et al.</td>
<td>1996</td>
<td>15 yrs</td>
<td>contraceptive births, Spring 1972-1973, Dunedin, New Zealand</td>
<td>475</td>
<td>3 &gt; 18 yrs</td>
<td>100%</td>
<td>Low-upper</td>
<td>&gt;93% Cau</td>
<td>Low regulation combined with negative emotionality &amp; negativity (lack of control) at ages 3–10; predicted violent criminal status by age 18.</td>
<td></td>
</tr>
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<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Convenience:</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lengua, Weis, &amp; Sandier</td>
<td>1998</td>
<td>Concurrent correlational</td>
<td>AZ court records of divorce petitions, mothers with child custody; 18% recruited through ads; self &amp; other referrals; metro area of Phoenix, AZ</td>
<td>232</td>
<td>9-12 yrs</td>
<td>50%</td>
<td>Low-middle</td>
<td>Mother reports of impulsivity &amp; negative emotionality were related to mother &amp; child reports of conduct problems. This study attempted to reduce item contamination by eliminating items determined to be overlapping according to confirmatory factor analysis &amp; expert ratings.</td>
<td></td>
</tr>
</tbody>
</table>

#### Key Statistics

- **Aggression Age 11, Stimulation Seeking Age 3**
  - $F(1, 199) = 6.1, p < .02, d = .25$
  - $F(1, 289) = 3.6, p < .05$ (control for SES)
  - $F(1, 289) = 4.4, p < .04$
  - (covariates: height, weight, bulk, & fearlessness)
  - ANOVAs, ANCOVAs, Cohen's $d$

- **Regression, NE, & Externalizing**
  - $R^2 = .29, F = 34.33, p < .001$
  - Convicted parent: multiple $R = .36$
  - Convicted delinquent: multiple $R = .40$
  - $R^2 = .29, F = 14.99, p < .001$
  - (covariates: low school attainment, delinquent older siblings, poor housing, poor parent child rearing, low commitment to family)
  - (forward stepwise multiple regression)

- **Regression & Negative Emotionality**
  - Violent vs. no conviction: $R = 1.52$, $r = .42$, $SE = .17$, $p < .05$
  - Violent vs. nonviolent conviction: $R = 1.75$, $r = .56$, $SE = .19$, $p < .01$
  - (logistic regression analysis)

- **Temperament & Conduct, Mother & Child Reports**
  - $r_s = -.13, p < .05$, $r = .44$, $p < .01$ (-) emotionality
  - $r_s = .18, p < .01$, $r = .46$, $p < .01$ impulsivity
  - $r_s = -.13, p < .05$, $r = .43$, $p < .01$ attentional focusing
  - (order of $r_s$'s: mother report, temperament & child report, conduct, mother reports of temperament & conduct)
  - (zero-order correlations, items based on factor analysis)
## Child Characteristics—Cognitive Influences

### ADHD

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Description</th>
<th>Size</th>
<th>Age Range</th>
<th>Sex</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biederman, Faraone, et al.</td>
<td>1995</td>
<td>Prospective longitudinal</td>
<td>Clinic referred for ADHD &amp; pediatric referrals to control</td>
<td>260</td>
<td>6-17 yrs &gt; 10-11 yrs</td>
<td>Male = 100%</td>
<td>N/R</td>
<td>100% Caucasian</td>
<td>Children with ADHD &amp; ODD at baseline were more likely to meet criteria for CD after wave 1 than children without ODD. Children with ADHD at baseline were more likely to meet criteria for CD after wave 1 than children without ADHD.</td>
</tr>
<tr>
<td>Mannuzza, Klein, et al.</td>
<td>1991</td>
<td>Prospective longitudinal replication</td>
<td>Clinic referred for hyperactivity without diagnosis of delinquency or aggressiveness; controls recruited at follow-up from medical center &amp; phone calling, no risk behavior problems</td>
<td>172</td>
<td>Mean = 7.3 yrs &gt; 18.8 yrs</td>
<td>Male = 100%</td>
<td>N/R</td>
<td>100% Caucasian</td>
<td>Children diagnosed with ADHD without a primary or secondary diagnosis of aggression or delinquency were more likely to meet criteria for conduct disorder or antisocial personality disorder during late adolescence/early adulthood than normal controls. *ODD not assessed.</td>
</tr>
<tr>
<td>Moffitt</td>
<td>1990</td>
<td>Prospective longitudinal</td>
<td>Population: consecutive births, spring 1972-1973, Dunedin, New Zealand</td>
<td>435</td>
<td>3 &gt; 15 yrs</td>
<td>Male = 100%</td>
<td>N/R</td>
<td>&gt; 93% Caucasian</td>
<td>Children in the ADHD + delinquency group at age 3 had higher levels of antisocial behavior at ages 5, 7, 9, 11 (but not at age 13) than children in the delinquency-only group. The delinquency-only &amp; ADHD + delinquency groups had higher levels of antisocial behavior than the ADHD-only group &amp; disordersocial controls.</td>
</tr>
</tbody>
</table>

### Executive Functioning and Inhibitory Control

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Description</th>
<th>Size</th>
<th>Age Range</th>
<th>Sex</th>
<th>N/R</th>
<th>N/R</th>
<th>Deficits in response inhibition related to slow inhibitory process as determined by the Inhibition Function Slope and the Stop Signal Reaction Time were found for children with externalizing disorders (ADHD, conduct disorder, ADHD + conduct disorder) compared to normal controls.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oosterlaan, Logan, &amp; Sergeant</td>
<td>1998</td>
<td>Meta-analysis</td>
<td>Clinic referred</td>
<td>456</td>
<td>6-12 yrs</td>
<td>Male = 100%</td>
<td>N/R</td>
<td>N/R</td>
<td>Inhibition Function Slope: ADHD vs. control (6 studies) $d = .94$, $Z = 6.36$, $p &lt; .001$ weighted $M^2 = 10.2$ ADHD, 14.8 control Conduct disorder vs. control (6 studies) $d = .56$, $Z = 2.35$, $p &lt; .05$ weighted $M^2 = 12.6$ CD, 16.0 control Stop Signal Reaction Time: ADHD vs. control (7 studies) $d = .64$, $Z = 4.97$, $p &lt; .001$ weighted $M^2 = 349.4$ ADHD, 246.4 control Conduct disorder vs. control (2 studies) $d = .31$, $Z = 2.64$, $p &lt; .01$ weighted $M^2 = 265.7$ CD, 248.0 control</td>
</tr>
</tbody>
</table>

### Key Statistics

- **ODD vs. Non-ODD**
  - $x^2 = 4.01$, $p < .05$

- **ADHD vs. Non-ADHD**
  - $x^2 = 2.35$, $p = ns$
  - (Data analyzed by reviewer, percentages not reported)

- **Prevalence CD or Antisocial PD at Followup**
  - $x^2 = 15.11$, $p < .001$
  - 32% probands with ADHD, 8% controls

- **Group, Followup CD or Antisocial PD, Control for SES**
  - Adjusted OR = 4.9, $p < .01$, 95% CI = 1.4-3.6
  - (logistic regressions)

- **Antisocial Behavior & ADD**
  - $F (12, 1202) = 14.92$, $p < .001$ group × age
  - $F (3, 463) = 57.75$, $p < .001$ group
  - (ANOVA, means not reported)
### Child Characteristics—Cognitive Influences

#### Executive Functioning and Inhibitory Control

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Dobroszian &amp; Sergeant</td>
<td>1996</td>
<td>Concurrent group comparisons</td>
<td>Recruited children with externalizing behaviors from education services &amp; comparison group from regular classrooms</td>
<td>70</td>
<td>6–12 yrs</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Children with externalizing disorders, including aggression &amp; ADHD, were characterized by poor inhibitory control as determined by a more variable response execution &amp; deficient inhibitory control.</td>
</tr>
</tbody>
</table>

Séguin, Boulence, et al. | 1999 | Prospective longitudinal 9 yrs | Boys in 53 public schools, low-SES areas, Montreal, Canada; rated by kindergarten teachers; eligible boys had Canadian-born, French-speaking parents with < 15 yrs of education | 149 | 6–15 yrs | 100% | 100% | Low (U.S.) | Conditional association learning was lower for the unstable aggressive group than for the stable or nonaggressive group. Subjective ordering abilities were lower for the stable aggressive group than the unstable or nonaggressive groups. Analyses controlled for ADHD status, IQ, negative emotionality, & general memory. |

#### Cognitive Ability

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferguson &amp; Nenwood</td>
<td>1995</td>
<td>Prospective longitudinal 7 yrs</td>
<td>Birth cohort, mid-1977, Christchurch, New Zealand, urban, high attrition</td>
<td>709</td>
<td>8–15 yrs</td>
<td>N/R</td>
<td>85%</td>
<td>U.S.</td>
<td>IQ and disruptive behavior (conduct problems &amp; attention deficit) at age 11 mediated the relationship between scholastic ability at age 13 &amp; delinquency at age 15.</td>
</tr>
</tbody>
</table>

Key Statistics

- **Response Execution Process, Latency (MRT)**
  - $F(3, 66) = 4.02, p = .011$
  - $M_{Ss} = 228$ ADHD, 398 age, 385 anxious, 352 control
- **Response Execution Process, Variability of Response**
  - $F(3, 66) = 5.92, p = .001$
  - $M_{Ss} = 116$ ADHD, 110 aggressive, 95 anxious, 81 control (ANOVA; post hoc Tukey)
- **Inhibitory Process, Stop Signal Reaction Time**
  - $t(33) = 3.77, p = .001$ aggressive vs. control
  - $t(39) = 1.81, p < .04$ ADHD vs. control
  - $M_{Ss} = 256$ ADHD, 224 control, 273 aggressive
- **Inhibitory Process, Probability of Inhibition, Inhibitory Function Slope**
  - $t(39) = 1.86, p < .04$ ADHD vs. control
  - $t(33) = 2.52, p < .009$ aggressive vs. control
  - $M_{Ss} = 1.63$ ADHD, 2.06 control, 1.45 aggressive (ANOVA; planned comparisons, one-tailed)

**Executive Functioning, Posterior Dorsolateral Frontal Conditional Association Tasks**

- **Partial F(2, 138) = 3.90, p < .05, $r^2 = .05$**
  - $t(100) = 2.41, p < .02$ stable vs. unstable agg
  - $t(90) = 2.34, p = .01$ unstable vs. nonagg
  - $M_{Ss} = .10$ stable, .27 unstable, .13 nonagg
- **Executive Functioning, Mid-dorsolateral Frontal Lobe Subjective Ordering**
  - **Partial F(2, 138) = 4.19, p < .01, $r^2 = .06$**
  - $t = 3.02, p < .003$ unstable agg vs. nonagg
  - $M_{Ss} = .19$ stable, .01 unstable, .24 nonagg (MANCOVA, covariates: ADHD status, IQ, negative emotionality, & general memory; ANOVAs, planned contrasts; effect size–eta square)

**Scholastic Ability Age 13, Delinquency Age 15**

- Log likelihood $\chi^2(34) = 27.6, p > .60, GFI = .59$
- $\beta = .68, p < .0001$ conduct–delinquency 15
- $\beta = .205, p = .01$ school ability–delinquency
- $\beta = .78, p < .0001$ conduct–attention deficit
- $\beta = .27, p < .0001$ attention deficit–school ability
- $\beta = .38, p < .0001$ IQ–school ability
- $\beta = .41, p < .0001$ IQ–attention problems
- $\beta = .38, p < .0001$ IQ–conduct problems (structural equation model)
Child Characteristics—Cognitive Influences

Cognitive Ability

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stallin &amp;</td>
<td>1993</td>
<td>Prospective</td>
<td>Recruited every 4th</td>
<td>122</td>
<td>3 yrs, &gt; 30 yrs</td>
<td>100%</td>
<td>N/R</td>
<td>100% Cau</td>
<td>Early language ability (18 &amp; 24 months, age 3, &amp; age 5) &amp; IQ at age 3 (but not 5, 8, 11, 14, or 17) was negatively associated with criminality by age 30, controlling for SES. Nonoffenders had higher average IQ scores from ages 3 to 17 than did frequent offenders.</td>
</tr>
<tr>
<td>Klackenberg-</td>
<td></td>
<td>Longitudinal</td>
<td>mother, prenatal clinic, Stockholm, Sweden, 1955-1958; pilot group included</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Lanson</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, Hoff,</td>
<td>1989</td>
<td>Prospective</td>
<td>Consecutive births, Spring 1972-1973, Dunedin, New Zealand</td>
<td>804</td>
<td>5 &gt; 15 yrs</td>
<td>51%</td>
<td>N/R</td>
<td>&gt; 93% Cau</td>
<td>Delinquency at ages 13-15 was associated with lower average IQ at ages 7, 9, 11, &amp; 13 for high- &amp; low-risk boys and girls.</td>
</tr>
<tr>
<td>&amp; Shea</td>
<td></td>
<td>Longitudinal</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Academic Achievement

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% R</th>
<th>Grade</th>
<th>% Polyn</th>
<th>Conduct problems at age 8 were associated with increased risk of leaving school without qualifications, controlling for IQ &amp; attention problems (9 yrs), maternal age, parental conflict, &amp; living standards (0-8 yrs). Adolescent behavior patterns, age 16-16, disaffected peer affiliations, cannabis use, &amp; school suspensions mediated the relationship between conduct problems in middle childhood &amp; leaving school without qualifications, controlling for the above-mentioned variables.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferguson &amp;</td>
<td>1998</td>
<td>Prospective</td>
<td>1977 birth cohort, Christchurch, New Zealand, urban, high atti</td>
<td>969</td>
<td>8 &gt; 18 yrs</td>
<td>N/R</td>
<td>Low-Upper</td>
<td>85% Cau</td>
<td></td>
</tr>
<tr>
<td>Harwood</td>
<td></td>
<td>Longitudinal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15% Poly (yr 5)</td>
<td></td>
</tr>
</tbody>
</table>

Frick, Kamphaus, et al. 1991 Concurrent group comparisons Source specific: children referred to 3 university-based clinics for disruptive behavior problems 177 7–12 yrs 100% Low-Upper at least 12% in each of 5 Hollingshead levels 70% Cau 30% N/R Academic underachievement was associated with ADHD & conduct disorder (CD) diagnoses. When the co-occurrence of ADHD & CD was taken into account, academic underachievement was associated with ADHD and not CD.  

Key Statistics

Early Language Ability, IQ, & Criminality by Age 30
- Partial $r = .16$ language ability, 18-24 months
- Partial $r = .15$ language comprehension, 3 yrs
- Partial $r = .18$ language comprehension, 3 yrs
- Partial $r = .15$ language maturity, 5 yrs
- Partial $r = .16$ IQ, age 3

$\alpha = .05$ nonparametric, 94.4 frequent (partial correlations, SES controlled, ANOVA, contrasts)

Total IQ Scores, Risk, & Delinquent Status
- $F(2, 407) = 4.82, p < .01$ boys
- $F(2, 407) = 3.31, p < .05$ girls

$\alpha = 98.6$% high-risk, $102.9$% low-risk disaffected
$\alpha = 105.6$% high-risk, $109.6$% low-risk nondelinquent
$F(2, 407) = 3.31, p < .05$ girls

$\alpha = 97.8$% high-risk, $101.2$% low-risk disaffected
$\alpha = 105.2$% high-risk, $107.4$% low-risk nondelinquent

$\alpha = .05$ nonparametric, 94.4 frequent (partial correlations, SES controlled, ANOVA, contrasts)

% Leaving School by Extent Conduct Problems
- OK = 1.8, $p < .05$ (95% CI = 1.3-2.6)
- 17.0% low (50-200), 19.9% low-risk (51-750)
- 23.2% mid (76-900), 26.8% mid-high (91-950)
- 30.7% high (96-1000 percentile)

% Leaving School by Extent Conduct
- $\alpha = .16$ adjusted for adolescent behavior
- $\alpha = .0001$ delinquent peer affiliations
- $\alpha = .05$ cannabis use
- $\alpha = .05$ suspension from school

19.5%-19% low, low-mid, mid-high, high (covariates: attention problems, age 3 WISC-R, maternal age, living standards, & parent conflict) (logistic regression models)

% of Children Underachieving, by Diagnosis
- 23% ADHD (n = 111), 22% CD (n = 68)
- 22% ADD + HY (n = 97), 7% clinic control (n = 62)

% of Children Underachieving, Control ADHD, CD
- 19% ADHD (n = 62), 5% clinic control (n = 19)
- 29% ADHD + CD (n = 29), 6% clinic control (n = 47)

(Chi-square, 2 x 2 logit model analysis)
Child Characteristics—Cognitive Influences on Academic Performance

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age Under 18</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maguin &amp; Loeb</td>
<td>1996</td>
<td>Meta-analysis</td>
<td>Convenience sample</td>
<td>28,552</td>
<td>19,265</td>
<td>74%</td>
<td>N/R</td>
<td>N/R% AFA</td>
<td>Lower academic performance was related to delinquency (seriousness, frequency, prevalence), even after controlling for SES. The relationship was stronger for males. Children with low academic performance were twice as likely to be delinquent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>68 studies</td>
<td></td>
<td></td>
<td>90%</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>42 cross-sectional</td>
<td></td>
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<td>4,637</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>26 longitudinal</td>
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</tbody>
</table>

Social Information Processing

<table>
<thead>
<tr>
<th>Crick</th>
<th>1995</th>
<th>Concurrent group comparisons</th>
<th>Convenience sample</th>
<th>239</th>
<th>3rd-6th gr</th>
<th>55%</th>
<th>N/R</th>
<th>26.6% AFA</th>
<th>Relationally &amp; relationally overtly aggressive children held more hostile attributions for relational &amp; instrumental conflict respectively than non-aggressive children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dodge, Bates, &amp; Pettit</td>
<td>1990</td>
<td>Prospective longitudinal</td>
<td></td>
<td>50</td>
<td>K &gt; 4th gr</td>
<td>52%</td>
<td>N/R</td>
<td>16% AFA</td>
<td>Social information processing variables predicted peer, teacher, &amp; observer ratings of aggression 6 mos. later. Significant variables included encoding of relevant cues, aggressive responses, hostile attribution bias, low solution generation, &amp; evaluations of aggression as leading to positive outcomes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 mos</td>
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</tbody>
</table>

Key Statistics

<table>
<thead>
<tr>
<th></th>
<th>Academic Performance &amp; Delinquency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES = -0.149, OR = 2.07 cross-sectional, bivariate</td>
<td></td>
</tr>
<tr>
<td>$z = 3.2, p &lt; .005$ ES = -15 males, .09 females</td>
<td></td>
</tr>
<tr>
<td>ES = -139 cross-sectional, control SES</td>
<td></td>
</tr>
<tr>
<td>ES = -127, OR = 1.87 longitudinal, bivariate</td>
<td></td>
</tr>
<tr>
<td>ES = -128 longitudinal, control SES</td>
<td></td>
</tr>
</tbody>
</table>

Entire Attributions & Relational Conflict

| F (2, 227) = 5.9, p < .01; M's = 7.2 agg, 5.6 non |
| F (2, 227) = 4.4, p < .01; M's = 6.6 agg, 5.2 non |

Entire Attributions & Instrumental Conflict

| (group x grade x sex ANOVAs; Duncan tests p < .05) |

Social Information Processing & Aggression

| Teacher ratings: R = .24, F (7, 294) = 2.51, p < .02 |
| r = .16, p < .006 encoding relevant cues |
| r = .16, p < .001 access aggressive responses |
| r = -.17, p < .001 no access competent responses |
| Peer ratings: R = .25, F (7, 294) = 2.70, p < .05 |
| r = -.13, p < .03 encoding relevant cues |
| r = -.19, p < .001 access aggressive responses |
| Observer ratings: R = .23, F (7, 294) = 3.86, p < .001 |
| r = .14, p < .02 hostile attribution bias |
| r = -.21, p < .001 solutions to social problems |

SIP & Externalizing Gr 4

| $R^2 = .11, p < .001$ |
| $\beta = .23, p < .001$ encoding errors |
| $\beta = .15, p < .05$ hostile attributions |
| $\beta = .23, p < .001$ access aggressive responses |

SIP & Conduct Problems

| F (4, 430) = 4.66, p < .001 |
| Encoding errors: F (1, 433) = 12.39, p < .001 |
| M's = .55 conduct problem, .05 no problem |
| Hostile attribution F (1, 434) = 4.44, p < .01 |
| M's = .37 conduct problem, .05 no problem |
| Access agg resp F (1, 433) = 4.47, p < .05 |
| M's = .37 conduct problem, .04 no problem |

Multiple regression, MANOVA, univariate ANOVAs

# of SIP Problems & Risk of Conduct Problems

| $\chi^2 (1, N = 442) = 11.76, p < .01 3 vs. no problems |
| $\chi^2 (1, N = 442) = 3.85, p < .05$ any vs. no problems |
| 6% no SIP problems, 13% 1 SIP problem |
| 16% 2 SIP problems, 27% 3 or 4 SIP problems (structural equation model) |
### Child Characteristics—Cognitive Influences

#### Social Information Processing

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hudley, Graham</td>
<td>1993</td>
<td>Intervention random</td>
<td>Recruited students rated by teachers &amp; peers as aggressive, 17 classrooms in 2 elementary schools, Los Angeles, CA, area</td>
<td>66</td>
<td>4th-6th gr.</td>
<td>100%</td>
<td>Low</td>
<td>100% A/LA</td>
<td>Aggressive boys showed improved social information processing &amp; were rated by teachers as less aggressive following an attributional intervention. Specifically, aggressive boys in the attributional treatment group showed reductions in attributions of hostile intent in response to ambiguous, hypothetical peer provocation (questionnaire measure), compared to boys in the attention training or control groups. Observations in a lab setting found that boys in the attributional treatment group were less likely to infer intentionality in peer provocation than boys in the other 2 groups.</td>
</tr>
</tbody>
</table>

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### Moral Reasoning and Social Problem Solving

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Source specific/convenience</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gregg, Gibbs, &amp; Baerger</td>
<td>1994</td>
<td>Concurrent group comparisons</td>
<td>Recruited incarcerated youth &amp; nonoffending suburban public high school students</td>
<td>323</td>
<td>13-19 yrs</td>
<td>54%</td>
<td>Low</td>
<td>20% A/LA</td>
<td>Delinquent female &amp; male adolescents had lower moral reasoning scores than nonoffending females, controlling for delinquency = 48%. Age, SES, &amp; verbal intelligence.</td>
</tr>
<tr>
<td>Nelson, Smith, &amp; Dodd</td>
<td>1990</td>
<td>Meta-analysis</td>
<td>15 studies</td>
<td>Not reported</td>
<td>673</td>
<td>11-17 yrs</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>Rubin, Bream, &amp; Rose-Krasnor</td>
<td>1991</td>
<td>Concurrent group comparisons</td>
<td>Recruited from elementary school, Southern Ontario</td>
<td>54</td>
<td>3rd-4th gr</td>
<td>50%</td>
<td>Low</td>
<td>20% A/LA</td>
<td>Peer-nominated aggressive children had more aggressive social goals (gain attention &amp; stop redicnt peers' behavior) to resolve hypothetical social dilemmas &amp; more aggressive social strategies (including hitting &amp; grabbing) to resolve naturalistic social dilemmas compared to nonaggressive children.</td>
</tr>
</tbody>
</table>

---

### Key Statistics

- **Aggression, Teacher Ratings**
  - \( F(2, 63) = 3.46, p < .05 \)
  - \( t(19) = 2.63, p < .05 \) attributional treatment group
  - \( M_d = 27.55, p < .05 \) post
  - \( p < .05 \) attention training, control groups
  - \( (p < .05) \) group 
  - \( x \) time repeated measures ANOVA
- **Intentionality, Ambiguous Hypo Peer Provocation**
  - \( F(6, 12) = 10.2, p < .01 \)
  - \( t(19) = 8.08, p < .001 \) attributional treatment group
  - \( M_d = 5.31, p < .001 \) post
  - \( (p < .05) \) attention training, control groups
  - \( (p < .05) \) group 
  - \( x \) time repeated measures ANOVA
- **Intention Ratings, Analog Task, Peer Provocation**
  - \( F(2, 64) = 9.05, p < .001 \)
  - \( M_d = 2.23, p < .05 \) training, \( 4.72 \) control
  - \( (p < .05) \) ANOVA
  - \( M_d \) with different letters differ \( p < .05 \)

---

### Moral Judgment Maturity

- \( F(6, 317) = 30.45, p < .0001 \)
- \( M_d = 2.41, p < .001 \) delinquents
- \( M_d = 2.53, p < .001 \) nonoffending females
- \( (p < .05) \) main effects significant, \( F \) values not reported

---

### Moral Reasoning & Delinquent vs. Non-Delinquent

- \( Q(14) = 19.52, p < .05 \)
- \( d = 2.4, 95% Cl \) 0.74-.47

---

### Aggression & Social Goals

- \( R^2 = .26, F(6, 31) = 2.2, p < .05 \)
  - Partial \( r \) = .33 attention, .40 stop action, \( p < .05 \)
- \( R^2 = .34, F(11, 12) = 3.00, p < .05 \)
  - Partial \( r \) = .45, \( p < .05 \) gestures
  - Partial \( r \) = .33, \( p < .05 \) statements
  - Partial \( r = .29, p < .05 \) controlling acts

---

### Hostile-Aggressive, Teacher Ratings & Object Test

- \( r = -.36, p < .05 \)
- \( r = .36, p < .05 \) hostile-aggressive

---

### Hostile-Aggressive, Teacher Ratings & Friendship Test

- \( r = .25, p < .05 \) hostile-aggressive, \( .27, p < .01 \)
### Child Characteristics—Cognitive Influences
#### Moral Reasoning and Social Problem Solving

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Deficient &amp; Psychopathic Incentives</th>
<th>Low-Incentive (1 of 6 Canadian SES Categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trevenham &amp; Walker</td>
<td>1989</td>
<td>Concurrent group comparisons</td>
<td>44</td>
<td>15-18 yrs</td>
<td>100%</td>
<td>N/R</td>
<td>100% Cauc</td>
<td>15-18 yrs, high school students, incarcerated youth exhibited lower levels of moral reasoning when presented with hypothetical &amp; real-life dilemmas compared to a nonincarcerated comparison group.</td>
<td></td>
</tr>
</tbody>
</table>

#### Biological Influences—Autonomic Influences

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Source</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mezasaca &amp; Tremblay</td>
<td>1997</td>
<td>Concurrent correlational</td>
<td>Source-specific, recruited from larger study (see paper)</td>
<td>153</td>
<td>10-15 yrs</td>
<td>100%</td>
<td>Low</td>
<td>100% Cauc</td>
<td>Increasing levels of antisocial behavior were associated with lower heart rate (HR), respiratory-driven cardiac-activated vagal control (HF HRV), &amp; sympatho-vagal (LF/HF) balance, not accounted for by differences in respiratory drive.</td>
</tr>
<tr>
<td>Raine &amp; Mednick</td>
<td>1997</td>
<td>Prospective longitudinal</td>
<td>Unselected birth cohort, 1968; two towns in Mauritius (Island country in the Indian Ocean)</td>
<td>1,130</td>
<td>3 yrs</td>
<td>51%</td>
<td>N/R</td>
<td>&lt;5.6% Asian, &lt;5.5% Cauc</td>
<td>Children in the low resting heart rate (HR) group at age 3 were twice as likely to be in the high aggression group at age 11. Low HR children had higher aggression scores, more nonaggressive behavior, &amp; more total antisocial behavior at age 11 than children in the high HR group. Children in the low aggressive group had lower HRs than children in the low aggressive group. This effect remained across separate analyses controlling for biological (body size, motor activity), psychological (family discord, temperament, SES deprivation) &amp; cognitive (hyperactivity) confounds.</td>
</tr>
<tr>
<td>Raine &amp; Williams</td>
<td>1995</td>
<td>Prospective longitudinal matched group comparisons</td>
<td>Recruited from schools in north England city, (1) working-class, poor academic; (2) residential &amp; rural, good academic; (3) mixed, unselected</td>
<td>51</td>
<td>15 &gt; 29 yrs</td>
<td>100%</td>
<td>Low-middle (North England)</td>
<td>Higher resting heart rate (HR), resting electrophysiological (EDA), &amp; orienting EDAs at age 15 predicted absence of criminality at age 29. Desistors had higher resting HRs, resting EDAs, and orienting EDAs than criminals. Desistors: ASB age 15 — no adult crime; normals: no ASB age 15 or adult crime; criminals: ASB age 15 &amp; adult crime</td>
<td></td>
</tr>
</tbody>
</table>

#### Key Statistics

- **Moral Reasoning, Delinquency, Psychopaths, Controls**
  - $F(2, 41) = 5.60, p < .01$ group x dilemma
  - $M = 257.5^*$ normal controls
  - $M = 230.2^*$ delinquents, 234.7 psychopaths
  (p < .05 dilemma type, p = ns interaction) (group x dilemma type ANOVA, Tukey comparisons, M's with different letters differ p < .05)

- **Aggressive Behavior, Self Report & HR**
  - Standing HR
    - PE = 3.95, partial $F(2, 121) = 7.33, p < .008$
    - Supine HF HRV
      - PE = 4.96, partial $F(1, 118) = 9.84, p < .002$
    - Supine LF/HF
      - PE = 1.40 (06), partial $F (2, 111) = 6.20, p < .02$ (stepwise regression)

- **Aggression Group & Low Resting HR**
  - $\chi^2 = 12.1, df = 3, p < .005$, $d = .64, 2.06$ risk
  - 45.5% low HR, 34% high HR, aggression ($2 \times 2$ chi-square)

- **HR Age 3, Aggression & Antisociality Age 11**
  - $F(1, 360) = 9.2, p < .003, d = 32$ aggression
  - $F(1, 360) = 4.3, p < .04$ nonaggressive antisocial
  - $F(1, 360) = 7.7, p < .006$ total antisociality

- **HR Age 3, Aggression Age 11, Covariates**
  - $F(1, 360) = 7.2, p < .006$ control body size
    - $F(1, 360) = 7.8, p < .006$ control motor activity
    - $F(1, 360) = 9.9, p < .002$ control family discord
    - $F(1, 360) = 4.3, p < .04$ control temperament
    - $F(1, 360) = 9.4, p < .002$ control SES deprivation
    - $F(1, 360) = 7.9, p < .005$ control hyperactivity
      - (ANOVA & ANCOVA, M's not reported)

- **Autonomic Arousal, Age 15 & Criminality, Age 29**
  - $F(2, 40) = 3.6, p < .04$
    - $r(29) = 2.9, p < .007$ desisters vs. criminals
    - $r = 1.2, p = .007$ desisters vs. normals
    - $r = .7, p = .06$ desisters vs. 63 criminals
    - $r = .8, p = .04$ desisters vs. 63 criminals
    - $r = .8, p = .04$ desisters vs. 63 criminals
    - $r = .8, p = .04$ desisters vs. 63 criminals
    - (MANOVAs, ANOVAs, planned comparisons, 2-tailed f-tests)
### Child Characteristics—Biological Influences

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moss, Vanyukov, &amp; Martin</td>
<td>1995</td>
<td>Concurrent group comparisons</td>
<td>Source specific: sons of fathers with &amp; without Ix of psychoactive substance abuse, recruited through ads, tr &amp; community centers</td>
<td>184</td>
<td>10–12 yrs</td>
<td>100%</td>
<td>Low-middle</td>
<td>N/R</td>
<td>More aggressive delinquent behavior, higher impulsive behavior, and higher risk for substance abuse were associated with lower cortisol responsivity.</td>
<td></td>
</tr>
<tr>
<td>Susman, Dorn, et al.</td>
<td>1997</td>
<td>Prospective longitudinal 1 yr</td>
<td>Convenience: sample recruited from suburban Washington, DC</td>
<td>36</td>
<td>9–15 yrs</td>
<td>58%</td>
<td>Middle–upper middle</td>
<td>N/R</td>
<td>Increased cortisol reactivity was associated with more nonaggressive behavior problems and overall conduct behavior problems 1 yr later.</td>
<td></td>
</tr>
<tr>
<td>Finkelstein, Susman, et al.</td>
<td>1997</td>
<td>Experiment randomized double-blind, placebo-controlled, crossover design</td>
<td>Source specific: recruited youth referred for potential delay to outpatient clinic</td>
<td>49</td>
<td>10–19 yrs</td>
<td>76%</td>
<td>N/R</td>
<td>N/R</td>
<td>Physical aggression &amp; aggressive impulses increased following low &amp; mid-level doses of estrogen for girls &amp; mid-level doses of testosterone for boys.</td>
<td></td>
</tr>
<tr>
<td>Ollin, Mattsson, et al.</td>
<td>1988</td>
<td>Prospective longitudinal 3 yrs</td>
<td>Population: representative sample of male public school 3rd grade students</td>
<td>58</td>
<td>15–17 yrs</td>
<td>100%</td>
<td>N/R</td>
<td>100% (Swedish)</td>
<td>High levels of plasma testosterone were associated with low frustration tolerance (more impatience &amp; irritability) &amp; more provoked aggressive behavior (self-report). Low frustration tolerance moderated the effect of plasma testosterone on provoked aggressive behavior. The model included mother's negativity &amp; permisiveness for aggression, parents' power assertiveness, &amp; retrospective report of boys' temperament.</td>
<td></td>
</tr>
</tbody>
</table>
### Child Characteristics—Biological Influences

#### Neurochemical Influences—Serotonin

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age Range</th>
<th>% Male</th>
<th>%/SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haberlin, Nowcom, et al.</td>
<td>1997</td>
<td>Concurrent group comparisons replication</td>
<td>Source: ADHD based on parent &amp; teacher ratings</td>
<td>50</td>
<td>7-11 yrs</td>
<td>100</td>
<td>N/R</td>
<td>N/R</td>
<td>Young aggressive boys had greater prolactin response to PBN challenge than young nonaggressive boys. There were no differences in prolactin response for aggressive or nonaggressive older children over 9.1 yrs old.</td>
</tr>
</tbody>
</table>

#### Key Statistics

**Prolactin Response to PBN Challenge (5-HT function)**

- \( F(2, 47) = 5.24, p < .05 \) (age × group)
- \( M = 14.97 \text{ ng/ml} \) young, aggressive
- \( M = 9.32 \text{ ng/ml} \) young, nonaggressive

(controlling for plasma medication level)

(ANCOVA)

**Physical Aggression & 5-HIAA Concentration**

- Partial \( r = .53, p = .006 \)

(partial correlation, controlling for age)

**PRL Response to PBN Challenge, Aggression, & Adverse Rearing (Encouragement of Maturity)**

- \( \beta = .32, t = 2.9, df = 29, p < .01 \) aggression
- \( \beta = -.44, t = 3.6, df = 26, p < .001 \) encour. maturity

(controlling for baseline prolactin)

(multiple regression)

### Dopamine

#### Key Statistics

**Dopamine Levels and Conscence Functioning**

- \( t(15) = 2.08, p < .03 \) (one-tailed)
- \( M(50) = 25.18(18.9) \) better conscience funct.
- \( M(50) = 12.74(5.92) \) poor conscience funct.

(*Interference with authority/peer valuation*)

(\( t \) test)

**Sensation Seeking & Plasma DH Activity**

- \( r = .35, p < .05 \) distribution
- \( r = .39, p < .05 \) sensation seeking, total score

(Pearson correlation)

<table>
<thead>
<tr>
<th>Authors</th>
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<th>Representativeness</th>
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<th>Age Range</th>
<th>% Male</th>
<th>%/SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kupfer, Kramer, &amp; Loewy</td>
<td>1990</td>
<td>Concurrent correlational</td>
<td>Source: referred during childhood to outpatient clinic for overactivity</td>
<td>31</td>
<td>21-23 yrs</td>
<td>100</td>
<td>N/R</td>
<td>100% Caus</td>
<td>Plasma dopamine beta-hydroxylase (DBH) was positively associated with disinhibition &amp; sensation seeking.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Limson, Goldman, et al.</td>
<td>1991</td>
<td>Concurrent correlational</td>
<td>Source: chronic alcoholic inpatient nonalcoholic controls</td>
<td>65</td>
<td>44 yrs</td>
<td>100</td>
<td>N/R</td>
<td>N/R</td>
<td>Greater lifetime history of impulsivity-aggressivity was associated with lower concentrations of CSF dopamine metabolite HVA.</td>
</tr>
</tbody>
</table>

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<th>% Male</th>
<th>%/SES</th>
<th>Ethnicity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Knueser, Hibbs, et al.</td>
<td>1992</td>
<td>Prospective longitudinal</td>
<td>Source: all diagnosed with disruptive behavior disorder</td>
<td>20</td>
<td>6-17 yrs</td>
<td>90%</td>
<td>N/R</td>
<td>17% Atra</td>
<td>Lower 5-HIAA at initial assessment predicted severity of physical aggression at followup for children with disruptive behavior disorders.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Authors</th>
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<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age Range</th>
<th>% Male</th>
<th>%/SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine, Coplan, et al.</td>
<td>1997</td>
<td>Prospective longitudinal</td>
<td>Source: all younger siblings of delinquents, NY, NY</td>
<td>34</td>
<td>3-13 yrs</td>
<td>100</td>
<td>Low</td>
<td>44% Atra</td>
<td>Higher aggression and lower encouragement of maturity was associated with greater prolactin (PRL) response to PBN challenge.</td>
</tr>
</tbody>
</table>

### Conclusions

- Prolactin response to PBN challenge is influenced by age and group, with aggressive boys showing higher response compared to nonaggressive boys.
- Physical aggression levels correlate with 5-HIAA concentrations, indicating a potential role in aggression.
- Dopamine levels are linked to conscience functioning, with better conscience associated with higher dopamine levels.
- Sensation seeking is positively correlated with plasma DH activity, suggesting a relationship between dopamine metabolites and sensation-seeking behaviors.
### Child Characteristics—Biological Influences

#### Maternal Age

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES Low-High</th>
<th>SES Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christ, Lahay, et al.</td>
<td>1990</td>
<td>Conventional</td>
<td>3 outpatient psychology/psychiatry clinics, eligible lived with biological parent, had no mental retardation, psychosis</td>
<td>253</td>
<td>6-13 yrs</td>
<td>100%</td>
<td>26.5% unskilled</td>
<td>87.5% Cau</td>
<td>Teenage motherhood (&lt; 20 or &lt; 18 yrs old, first child or referred child) correlated with total number of child conduct problems. Conception of models that included SES &amp; maternal &amp; paternal antisocial personality found that the data were best fit by a model indicating a spurious relationship between teenage motherhood &amp; child conduct problems, rather than a mediational or independent effects model.</td>
</tr>
<tr>
<td>Ferguson, &amp; Lynskey</td>
<td>1993</td>
<td>Prospective longitudinal</td>
<td>from birth cohort, 1977, Christchurch, New Zealand, urban; 81% of original cohort</td>
<td>953-1,048</td>
<td>Birth &gt; 8, 10, 12 yrs</td>
<td>55%</td>
<td>Low-upper</td>
<td>15% Polyn (yrs 5)</td>
<td>Higher maternal age (&lt; 20, 20-24, 25-29, 30+ yrs old) was related to fewer childhood &amp; early adolescent (ages 8, 10, &amp; 12) behavior problems (mother &amp; teacher reports). This relationship held for age 12 behavior problems (but not age 8 or 10), controlling for measures of maternal background &amp; childhood life history, including maternal ed, SES, family size, avoidance of punishment, &amp; parental closeness.</td>
</tr>
<tr>
<td>Speker, Larson, et al.</td>
<td>1997</td>
<td>Concurrent descriptive</td>
<td>recruited pregnant adolescents ≤ 17 yrs from prenatal clinics, public schools, &amp; nonprofit agencies in metro area of Northwest city</td>
<td>152</td>
<td>6 yrs</td>
<td>50.5%</td>
<td>Low-middle 47% public assistance; 29% &lt; 12 yrs; 26% &lt; 12 yrs; 49% &gt; 12 yrs maternal ed</td>
<td>32% A/EA; 38% Cau</td>
<td>Mother and/or teacher reports of externalizing were above the borderline clinical cutoff for more than half of a sample of 5-yr-old children who had been born to adolescent mothers.</td>
</tr>
</tbody>
</table>

#### Key Statistics

- **Maternal Age & Conduct Disorder**
  - $r = -.13, p < .001 (n = 953)$
  - $M' = 54.5 (< 20), 53.3 (20-24), 52.0 (25-29)$
  - $50.2 (30+ yrs)$
  - (PS < .05: maternal education, SES, family size, avoidance of punishment, parental closeness)

- **Maternal Age, Conduct Disorder, Maternal Background, & Childhood Life History**
  - $r = -.19, p < .001 (n = 1,048)$

- **Best Fit Model**
  - $\beta = -.17, p < .05$ maternal antisocial—conduct
  - $\beta = -.16, p < .03$ paternal antisocial—conduct
  - $\beta = -.33, p < .001$ SES—conduct
  - $\beta = .15, p < .05$ maternal antisocial—teen mother
  - $\beta = .20, p < .001$ paternal antisocial—teen mother
  - $\beta = -.55, p < .001$ SES—teen mother

(For analyses with preborn, not 1st child and/or under 18 yrs old not provided, results similar.)

- **Extremalizing, Mother and/or Teacher Reports**
  - $r = .92, 45.7% neither, 35.8% either, 18.5% both$
  - $GHS (n = 60)$
  - $45.2% neither, 45.0% either, 11.7% both$
  - (Proportion above borderline clinical cutoff, $T = 60$)

Wakschlag et al., 1997: see "Maternal Smoking"
**Child Characteristics—Biological Influences**

**Maternal Smoking**

<table>
<thead>
<tr>
<th>Authors</th>
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<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES Low-upper</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brenan, Grekin,</td>
<td>1999</td>
<td>Prospective</td>
<td>Population from birth cohort, Copenhagen, Denmark, 5/39-12/61</td>
<td>3,266</td>
<td>34 yrs</td>
<td>100%</td>
<td>Low-upper</td>
<td>Danish</td>
<td>Maternal smoking during the 3rd trimester (0, 1-2, 3-10, 10-26, &gt; 20 cigarettes daily) predicted nonviolent &amp; violent arrests, &amp; persistent but not adolescent-limited offending. Analyses controlled for parental psychiatric hospitalizations, perinatal complications, SES, mother's age, drug use during pregnancy, father's criminal arrest, &amp; maternal rejection.</td>
</tr>
<tr>
<td>&amp; Medcick</td>
<td></td>
<td>longitudinal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferguson, Woodward,</td>
<td>1998</td>
<td>Prospective</td>
<td>Population from birth cohort, 1977 Christchurch, New Zealand, urban; 81% of original cohort</td>
<td>953-1,098</td>
<td>Birth &gt; 18 yrs</td>
<td>N/A</td>
<td>Low-upper</td>
<td>Caucasian</td>
<td>Rates of conduct disorder symptoms were related to maternal reports at birth of smoking during pregnancy. Adolescents whose mothers reported smoking 20+ cigarettes/day during pregnancy reported over 2 times more conduct disorder symptoms in the past 2 yrs than children of nonsmokers. After adjusting for confounding &amp; selection factors* the relationship remained &amp; was stronger for males than females. *childhood sexual abuse, physical punishment &amp; criminal behavior, maternal age &amp; education, &amp; pregnancy planning.</td>
</tr>
<tr>
<td>&amp; Horwood</td>
<td></td>
<td>longitudinal</td>
<td></td>
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<td></td>
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<td></td>
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</tbody>
</table>

**Navarro, Suddith, et al.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES Low-upper</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>Experiment random assignment</td>
<td>pregnant Sprague-Dawley rats, minipump inserted 4th day gestation, infusion stopped 21st day; bc: nicotine bitartrate, 2 mg/kg/day; day: control; water, sodium bitartrate</td>
<td>6-10+ each to group, 2-50 days postnatal age</td>
<td>18 days gestation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Low doses of nicotine (2 mg/kg/day) did not affect viability or growth (weight gain or litter size of pregnant rats, body &amp; brain weight of litter offspring at gestational day 18 or postnatally). However, postnatal analyses found impaired nervous system development in the nicotine-exposed group versus the control group; small increases in [H]nicotine binding in midbrain &amp; brainstem, increased dopamine dehydroxylase (ODC) activity across brain regions, reduced cerebellum DNA content &amp; concentration, &amp; lower kidney homocarnosine levels.</td>
</tr>
</tbody>
</table>

**Key Statistics**

- Nonviolent Crime & Maternal Smoking
  - \( \chi^2 (1, N = 3,728) = 13.28, \ p < .001 \)
  - OR = 1.13 (CI = 1.06-1.21), \( p < .001 \)
  - (\( p's < .05 \): delivery complications, drug use, SES, mother age, father crime, parent hospitalizations; \( p's = ns \): pregnancy complication, mother rejection)

- Violent Crime & Maternal Smoking
  - \( \chi^2 (1, N = 3,286) = 15.74, \ p < .001 \)
  - OR = 1.19 (CI = 1.09-1.30), \( p < .001 \)

- Life-Course Persistent Offending
  - \( \chi^2 (1, N = 3,286) = 9.45, \ p < .01 \)
  - OR = 1.15 (CI = 1.05-1.25), \( p < .01 \)

- Adolescent-limited \( \chi^2 (1, N = 3,151) = 2.70, \ p = ns \)
  - *(See study for additional significant predictors)*
  - *(logistic regression analyses)*

**Maternal Smoking & Conduct Disorder Symptoms**

- \( F (1, 1020), \ p < .001 \) linear trend
  - \( MS = .33, .56, .85 \)

- Adjusted for Confounding & Selection Factors
  - \( \beta = .12, \ p < .001 \)
  - \( MS = .35, .47, .56, .72 \)

- (\( p's < .05 \): childhood sexual abuse, parental use of physical punishment, & parental criminal behavior)
  - (\( p's = ns \): maternal age & education, planned pregnancy)

**Gender Differences, Adjusted for Confounds/Selection**

- \( F (3, 936), \ p < .001 \)
  - \( MS = .48, .76, 1.04, 1.12 \) male adolescents
  - \( MS = .20, .23, 0.26, .28 \) female adolescents
  - *(order of \( MS's \): 0, 1-9, 10-15, > 10 cigarettes/day)*

**Prenatal Nicotine Exposure & Brain Development**

- *Prenatal development of [H]nicotine binding*
  - \( F (1, 83) = 14.2 \) moles/mg protein ( \( n = 6-10 \) group)
  - \( MS = 75, 76, 85, 87, 61 \) control
  - \( MS = 79, 81, 101, 94, 66 \) nicotine
  - *(order of \( MS's \): postnatal age 2, 4, 7, 10, & 15 days)*

- *ODC activity*
  - \( F (1, 27) = 4.4 \) pmols/g/hr ( \( n = 8-10 \) group)
  - Cerebellar DNA concentration & content*
  - \( F (1, 90) = 5.7 \) mg/g concentration ( \( n = 10 \) group)
  - \( F (1, 90) = 37.2 \) mg/g content
  - Kidney homocarnosine levels*
  - \( F (1, 131) = 4.8 \) mg/g ( \( n = 6-10 \) group)

  *Means not reported, in figures

  *(see study for figures & nonsignificant results)*

  *(ANOVA)*
Child Characteristics—Biological Influences
Maternal Smoking

<table>
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<tr>
<th>Authors</th>
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<th>Size</th>
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<th>SES</th>
<th>Ethnicity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Wakschlag, Laney, et al.</td>
<td>1997</td>
<td>Retrospective correlational</td>
<td>followed for 5 yrs, T1 not predicting T6</td>
<td>177</td>
<td>7-12 yrs</td>
<td>10%</td>
<td>Low-upper</td>
<td>79% Cauc</td>
<td>Mothers who smoked more than half a pack of cigarettes a day during pregnancy (based on retrospective reports 7-12 yrs later) were 5 times more likely to have a child with conduct disorder (CD) than mothers who smoked less than half a pack per day, controlling for SES &amp; paternal antisocial personality disorder (APD). Smoking continued to predict CD in models including paternal psychopathologic conditions, pregnancy, family, &amp; parenting risk factors. Maternal age, harsh discipline, &amp; little supervision also predicted CD.</td>
</tr>
<tr>
<td>Wakschlag, Laney, et al.</td>
<td>1999</td>
<td>Prospective longitudinal 10 yrs</td>
<td></td>
<td>147</td>
<td>6-23 yrs</td>
<td>48%</td>
<td>Low-upper</td>
<td>100% Cauc</td>
<td>The risk of developing preschooler onset conduct disorder was 4 times greater for boys of mothers who smoked 10 or more cigarettes daily during pregnancy, than boys of mothers who did not smoke at all. Results were adjusted for maternal major depression disorder (MDD), offspring age, &amp; divorce. The relationship was not explained by parental diagnosis, family risk factors, postnatal smoking, or prenatal/early development history. Girls whose mothers smoked had a 5 times greater risk for adolescent drug abuse/dependence.</td>
</tr>
</tbody>
</table>

Prenatal Exposure to Alcohol

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Source specific: convenience: recruited parents with history of depression from all clinics &amp; normal controls (matched on age) from community surveys</th>
<th>Size</th>
<th>Prenatal</th>
<th>% Low</th>
<th>M $\leq 10k$</th>
<th>94% AfHA</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, Coles, et al.</td>
<td>1991</td>
<td>Prospective longitudinal 5-8 yrs group comparisons</td>
<td>selected mothers from earlier study who (1) drank during pregnancy, (2) stopped 2nd trimester, after alcohol education, &amp; (3) never drank (random sample); original sample recruited from participants for prenatal care</td>
<td>68</td>
<td>Prenatal</td>
<td>44%</td>
<td>Low</td>
<td>9% N/B</td>
<td>Children whose mothers drank throughout pregnancy had higher teacher ratings of externalizing (including inattentive, destructive, nervous/withdrawn, &amp; aggressive subscales) &amp; lower ratings of social competency than children of mothers who never drank, or who discontinued drinking in the 2nd trimester after alcohol education, controlling for caretaker's current drinking. Sustained attention &amp; teacher ratings of internalizing did not differ between groups once caretaker's current alcohol use was controlled.</td>
</tr>
</tbody>
</table>

Key Statistics

Basic Model Maternal Smoking & Childhood CD

- $\chi^2 = 36.2, df = 5, p < .001$
- Maternal smoking OR = 3.3, CI = 1.3-8.6, $p = .01$
- SES OR = 0.65, CI = 0.3-0.65, $p = .003$

Final Model Maternal Smoking & Childhood CD

- $\chi^2 = 56.1, df = 8, p < .001$
- Maternal smoking OR = 3.3, CI = 1.0-9.0, $p = .02$
- Maternal age OR = 0.90, CI = 0.84-0.97, $p = .01$
- Poor supervision OR = 2.6, CI = 1.0-6.7, $p = .03$
- Harsh discipline OR = 2.1, CI = 0.58-2.2, $p = .04$

Note: $\chi^2$ is in both models; SES, paternal APD, maternal MMPI, maternal smoking less than 1/2 pack/day (logistic regression analyses)

Maternal Smoking & Offspring Psychiatric Diagnosis

- Male, conduct disorder before age 13
- Relative risk = 4.1, CI = 1.5-10.7, $p < .01$
  (adjusted for maternal MDD, offspring age, divorce)
- Female, drug abuse/dependence in adolescence
- Relative risk = 5.36, CI = 1.43-20.17, $p < .05$
  (adjusted for offspring current smoking, maternal MDD, offspring age)
- (Cox proportional hazards regression model)

Behavioral Functioning, Social Competence, Teacher F (4, 90) = 4.15, $p < .004$ MANCOVA
- Externalizing F = 8.98, $p = .001$
  - MFS = 52 never, 52 stopped, 64 continued
- Descriptive F = 4.36, $p = .02$
  - MFS = 60 never, 59 stopped, 66 continued
- Inattentive F = 6.71, $p = .003$
  - MFS = 56 never, 53 stopped, 66 continued
- Restless/hyperactive F = 8.28, $p = .001$
  - MFS = 56 never, 57 stopped, 67 continued
- Aggressive F = 6.05, $p = .005$
  - MFS = 57 never, 57 stopped, 65 continued
- Social competence F = 9.73, $p = .0004$
  - MFS = 49 never, 46 stopped, 36 continued

(covariates: mother's current alcohol use, ages of children; (MANCOVAs, ANOVAs, Neuman-Keuls post hoc)
### Child Characteristics—Biological Influences

**Prenatal Exposure to Alcohol**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
</table>

### Prenatal Exposure to Drugs

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaney-Black, Covington, et al.</td>
<td>2000</td>
<td>Prospective longitudinal 6 yrs</td>
<td>Convenience: women screened at university-based prenatal clinic (8/91-9/91); block sampling design; oversampled for exposure to drugs, non-HIV+, singletons, no mental retardation at age 6 eligible for study</td>
<td>471</td>
<td>Prenatal &gt; 6 yrs</td>
<td>50%</td>
<td>Low &lt; 12 yrs</td>
<td>100% AA/NA</td>
<td>Prenatal cocaine exposure predicted age 6 externalizing-internatizing difference scores (teacher reports), controlling for custody change &amp; gender. For boys, cocaine exposure was associated with a greater likelihood of clinically significant externalizing &amp; delinquency scores.</td>
</tr>
</tbody>
</table>

### Key Statistics

**Cognitive & Academic Functioning, Summary Scores**

\[ F(10, 114) = 7.89, \ p < .005 \]

Sequential F = 3.12, p < .03

M's = 93 never, 92 stopped, 84 continued

Mental composite (IQ): F = 3.15, p < .05

M's = 92 never, 89 stopped, 84 continued

Achievement F = 6.67, p < .003

M's = 95 never, 88 stopped, 84 continued

**Academic Subtests**

F (4, 115) = 2.35, p < .04

M's = 97 never, 89 stopped, 84 continued

Reading/Decoding F = 3.98, p < .03

M's = 102 never, 92 continued

**Adaptive Behavior—statistics not reported**

(covariate: mother's current absolute alcohol use/wk)

(MANCOVAs, ANOVAs, Neuman-Keuls post hoc)

**Prenatal Alcohol Exposure & Behavior/Learning**

\[ r = .31 \]

(correlation between 13 alcohol measures & 186 learning/behavior measures)

\[ r = .26, \ (n = 319) \]

(partial correlation, 13 alcohol measures & 186 learning/behavior measures, controlling for 78 covariates; no significant interactions

(partial least squares analysis)

**Externalizing-Internalizing Difference, Teacher Report**

Model R = .10, p = .03

Individual R's not reported

(covariates: gender, custody change)

% Boys Clinically Significant Externalizing Scores

Approx M = 22.5 exposed (n = 94)

Approx M = 13.5 controls (n = 140)

% Boys Clinically Significant Delinquency Scores

Approx M = 17 exposed, 12 controls

(p's < .05; approximate M's from figure)

(stepwise multiple regression, two-tailed t tests)
## Child Characteristics—Biological Influences

### Prenatal Exposure to Drugs

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyer, Behrens, et al.</td>
<td>1998</td>
<td>Prospective longitudinal</td>
<td>Source specific screened &gt; 2,500 pregnant women at prenatal clinics &amp; hospitals for cocaine users &amp; matched controls (race, parity, SES, location of care); eligible: healthy, age 18+, English speakers *use cocaine &amp; marijuana, nicotine, alcohol only</td>
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<tr>
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<td></td>
<td>285</td>
<td>3.7-5.2 days old</td>
<td></td>
<td>Low</td>
<td>81% AHA</td>
<td>Alert responsiveness, general irritability, regulatory capacity, state regulation, examiner persistence, &amp; reinforcement value of infants’ behavior (Bradley subscales) were lower for infants exposed to cocaine prenatally than for nonexposed infants. Controlling for alcohol, tobacco, &amp; marijuana use, alert responsiveness remained lower for infants exposed to cocaine &amp; tobacco.</td>
</tr>
<tr>
<td>Leadar, LaGasse, &amp; Selzer</td>
<td>1998</td>
<td>Meta-analysis</td>
<td></td>
<td>8</td>
<td>Prenatal &gt; 4-11 yrs</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Children prenatally exposed to cocaine had lower IQ scores (2.26 points) than children not exposed. Effect size was small for IQ &amp; medium for receptive &amp; expressive language.</td>
</tr>
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<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td></td>
</tr>
</tbody>
</table>

### Genetic Influences on Conduct Disorder

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eidelbrock, Rende, et al.</td>
<td>1995</td>
<td>Concurrent correlational twin study</td>
<td>Convenience: from birth records; same-sex twin pairs; Western Reserve Twin Project</td>
<td>181</td>
<td>7-15 yrs</td>
<td>54%</td>
<td>Middle</td>
<td>3.1</td>
<td>Aggressive behavior, externalizing, &amp; attention showed significant genetic effects. Delinquency showed significant shared environmental effects.</td>
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<td></td>
<td></td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td></td>
</tr>
<tr>
<td>Silberg, Meyer, et al.</td>
<td>1995</td>
<td>Concurrent correlational twin study</td>
<td>Convenience: unscreened sample recruited from Virginia schools</td>
<td>389</td>
<td>11-16 yrs</td>
<td>100%</td>
<td>N/R</td>
<td>100% Cau</td>
<td>Membership in the hyperactive/ conduct disorder &amp; multichannel group was predominately explained by genetic factors. Membership in the pure conduct disorder group was explained by shared environmental factors.</td>
</tr>
</tbody>
</table>

### Genetic x Environmental Influences

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calente, Valente, et al.</td>
<td>1995</td>
<td>Concurrent correlational adoption study</td>
<td>Convenience: recruited from 4 adoption agencies in Iowa; biological mothers with a history of antisocial personality disorder (APD) or substance abuse &amp; nonymnomatic matched controls</td>
<td>197</td>
<td>18-47 yrs</td>
<td>48%</td>
<td>N/R</td>
<td>N/R</td>
<td>Conduct disorder showed genetic effects (biological parent APD) environmental effects (averse adoptive home environment), &amp; genetic-environmental interaction effects (biological parent, antisocial behavior = adverse adoptive home environment). Adolescent aggressivity also showed genetic x environmental interaction effects.</td>
</tr>
</tbody>
</table>

### Key Statistics

- Prenatal Cocaine Exposure & Brain Function:
  - Alert responsiveness: $p < .002$, $M^2 = 4.7$ (4 df), 3.9 coc
  - General irritability: $p < .02$, $M^2 = 6.5$ (4 df), 5.0 coc
  - Regulatory capacity: $p < .02$, $M^2 = 5.4$ (4 df), 4.9 coc
  - State regulation: $p = .04$, $M^2 = 6.2$ (4 df), 5.8 coc
  - Examiner persistence: $p = .02$, $M^2 = 4.9$ (4 df), 4.5 coc
  - Reinforcement value: $p < .02$, $M^2 = 6.3$ (4 df), 5.9 coc
  - Prenatal Cocaine, Alert Responsiveness, Controlling for Alcohol, Tobacco, & Marijuana Use $p < .03$, $R^2 = .06$, $M^2 = .04$, $p = .02$ (Wilcoxon rank sum test, multiple regression)

- Prenatal Cocaine Exposure, IQ, & Language:
  - IQ effect: 2.24 (2.01) IQ points
  - ES = .33 (13) SD units
  - Expressive language ES = .33 (13) SD units
  - (meta-analysis, Z scores, effect sizes)

- Genetic Effects ($p^2 = n^2$: shared environment):
  - $B = .89^{*}$.02, $p < .01$ aggressive behavior
  - $B = .89^{*}$.22, $p < .05$ externalizing
  - $B = .89^{*}$.02, $p < .01$ attention
  - Shared Environment ($p = n$: genetic)
    - $B = .37^{*}$.18, $p < .05$ delinquency
    - (multiple regression)

- Hyperactive-Internalizing Disorder: $A = .34$, $D = .34$, $E = .12$
- Multisymptomatic Class: $A = .34$, $E = .01$
- Pure Conduct Disturbance: $A = .31$, $C = .07$, $E = .02$
- Nonmultisymptomatic Class: $A = .05$, $C = .52$, $E = .03$
- $A = $ additive genes, $C = $ shared environment, $D = $ dominant genes, $E = $ unique environment
- (Latent class analysis)

- Genetic-Environmental Factors & Conduct Disorder:
  - $R^2 = .16$, $p < .0001$
  - $B = .31$, $p = .01$ biological parent APD
  - $B = .34$, $p = .0001$ adverse adoptive home environment
  - $B = .33$, $p = .01$ parent APD $= $ adoptive home
- Genetic-Environmental Factors & Add Adversity:
  - $R^2 = .19$, $p < .0001$
  - $B = .27$, $p = .0003$ biological parent APD
  - $B = .31$, $p = .0001$ parent APD $= $ adoptive home
- (p's: ns = alcoholic biological parent, prenatal exposure to alcohol, & interactions with adoptive home environment)
  - (linear regression models)
### Child Characteristics—Biological Influences

**Genetic x Environmental Influences**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nederhiser,</td>
<td>1999</td>
<td>Prospective longitudinal</td>
<td>Recruited same-sex</td>
<td>395</td>
<td>10-18 yrs</td>
<td>51%</td>
<td>Middle</td>
<td>N/R</td>
<td>The cross-lagged relationships between parental conflict &amp; negativit...</td>
</tr>
<tr>
<td>Reiss, et al.</td>
<td></td>
<td></td>
<td>sibling pairs</td>
<td></td>
<td>13-21 yrs</td>
<td></td>
<td>94% Cau.</td>
<td>6% Other</td>
<td></td>
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<tr>
<td>O'Connor,</td>
<td>1998</td>
<td>Concurrent group</td>
<td>Conveniences</td>
<td>53-59</td>
<td>7-12 yrs</td>
<td>N/R</td>
<td>Low-middle</td>
<td>N/R</td>
<td>Children at genetic risk for child behavior problems (biological pare...</td>
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<tr>
<td>Deater-Deckard,</td>
<td></td>
<td>comparisons</td>
<td>subset, sample</td>
<td></td>
<td></td>
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<td>95% Cau.</td>
<td>N/R</td>
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<tr>
<td>et al.</td>
<td></td>
<td>data collected</td>
<td>of biological</td>
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<td></td>
<td></td>
<td>5 times over</td>
<td>mothers recruited</td>
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<td>6 yrs; T1 did not predict T2</td>
<td>from 2</td>
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<td>adoption agencies.</td>
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<td>CO, 1975-1982</td>
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<td>Colorado Adoption</td>
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<td>Project</td>
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</tbody>
</table>

### Genetic Influences on Relevant Behaviors—Attention & ADHD

**Edelbrock et al., 1995: see "Genetic Influences on Conduct Disorder"**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gjone, Sundet</td>
<td>1996</td>
<td>Concurrent</td>
<td>Twins</td>
<td>915</td>
<td>5-15 yrs</td>
<td>49%</td>
<td>N/R</td>
<td>100% Cau.</td>
<td>Genetic and nonshared environmental influences were found for attention...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>correlational</td>
<td>from birth records,</td>
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<tr>
<td></td>
<td></td>
<td>Study</td>
<td>Norway, 1977-1979, 1983, 1986; sample higher than population on SES</td>
<td></td>
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</tbody>
</table>

### Key Statistics

- **Simple Evoked Model, Parental Discipline**
  \( r = .95, p < .01 \) bio disorder—stress—discipline
  \( \chi^2(12, N = 41) = 10.4, p = .53, \text{GFI} = .94 \)
  \( \beta = -.16, p = ns \) bio disorder—father discipline
  \( \beta = -.39, p < .05 \) bio disorder—adoptive behavior
  \( \beta = .78, p < .05 \) father discipline—adoptive behavior
- **Simple Evoked Model, Mother’s Discipline**
  \( r = .43, p < .01 \) bio disorder—mother discipline
  \( \chi^2(12, N = 41) = 7.05, p = .05, \text{GFI} = .96 \)
  \( \beta = .06, p = ns \) bio disorder—mother discipline
  \( \beta = -.52, p < .05 \) bio disorder—adoptive behavior
  \( \beta = -.77, p < .05 \) mother discipline—adoptive behavior (structural equation modeling)

- **Maternal Conflict-Negativity & Antisocial Behavior**
  \( \chi^2(189, N = 395) = 390.6, p = .05, \text{RMSEA} = .05 \)
  \( 100\% \text{ G, } 9.9 \text{ Es, } 9.9 \text{ En, } .17 \text{ F cross-lagged } \)
- **Paternal Conflict-Negativity & Antisocial Behavior**
  \( \chi^2(189, N = 395) = 364.3, p = .05, \text{RMSEA} = .05 \)
  \( 94\% \text{ G, } 0\% \text{ Es, } 0\% \text{ En, } .18 \text{ F cross-lagged } \)
  \( G = \text{ genetic, Es} = \text{ shared, En = nonshared environment (chi-square & not mean square error approximation) } \)

- **Genetic Risk & Adoptive Parental Negative Control**
  \( F(1, 57) = 6.64, p < .05 \)
  \( M_{Fs} = 25.5, 26.7, 26.4, 25.5, 28.3 \text{ at risk } \)
  \( M_{Fs} = 25.9, 25.4, 22.8, 22.1, 23.3 \text{ non-risk } \)
  \( r^{2} < .05 \) age 7, 9, 10, 11, 12
  \( p^{2} < .05 \) age 7, 9, 11, 12
  \( p < .06 \) age 10
  \( r = .43, p < .05 \text{ collapsed across waves range (r = .25–.53, p < .05) } \)

- **Genotype-Environment Mediation, Control Behavior**
  \( F(1, 49) = 2.22, p = .10 \text{ (control child behavior) } \)
  \( age 7: r = .28, p = .05 \text{ to } r = .18, p = .05 \text{ (ANOVA, repeated measures ANOVA, partial correlation) } \)

- **Genetic & Environmental Influences on Attention**
  \( a^2 = .73, b = .45, c = .27, \text{ } \chi^2(4) = 3.62 \text{ males 5-9 yrs } \)
  \( a^2 = .76, b = .40, c = .24, \text{ } \chi^2(4) = 2.51 \text{ females 5-9 yrs } \)
  \( a^2 = .75, b = .45, c = .23, \text{ } \chi^2(4) = 2.92 \text{ females 12-15 } \)
  \( a^2 = .79, b = .41, c = .21, \text{ } \chi^2(4) = 1.89 \text{ males 12-15 } \)
  \( b^2 \text{ = heritability, } a^2 \text{ = nonshared environment (structural equation model) } \)
Child Characteristics—Biological Influences
Genetic Influences on Relevant Behaviors—Attention & ADHD

**Authors**
Levy, Hay, & colleagues

**Year**
1997

**Design**
Concurrent, randomized twin study

**Representativeness**
Source: recruited from a single-sex twin registry; 1 twin per pair

**Size**
503 twins

**Age**
4-12 yrs

**% Male**
50%

**SES**
Low-middle

**Ethnicity**
N/R

**Result**
Attention deficit hyperactivity disorder (ADHD) symptoms

Key Statistics
- Heritability of Disorder, ADHD: $h^2 = .91$, $c^2 = .13$, $t = 7.58$, $p < .001$
- Heritability of Trait: $h^2 = .75$, $t = 3.31$, $p < .001$
- Heritability Disorder vs. Trait: $t = 6.7$, $p < .05$
- $h^2$ = heritability, $c^2$ = shared environment

(Regression models)

Shaman, McGuire, & Lanciano

**Year**
1997

**Design**
Concurrent, randomized twin study

**Population**
recruited from birth records, Minnesota, 1977-1981

**Size**
287 twins

**Age**
11-12 yrs

**% Male**
100%

**SES**
N/R

**Ethnicity**
N/R

**Result**
Attention deficit hyperactivity disorder (ADHD) symptoms

Key Statistics
- Heritability ADHD,Teacher Rating: $A = .75$, $C = 0$, $E = .27$ (4, $N = 181$) $= .51$, $p < .97$
- Heritability ADHD, Mother Rating: $A = .89$, $C = 0$, $E = .11$ (4, $N = 194$) $= .31$, $p < .33$
- $A = $ additive genetic, $E = $ nonshared environment
- $C = $ shared environmental effects

(Regression models)

Genetic Influences on Other Behaviors—Harm Avoidance/Behavioral Inhibition, Empathy/Prosocial Behavior, & Difficult/Irritable/Oppositional Behavior

Cypess, Phillips, et al.

**Year**
1990

**Design**
Concurrent, randomized twin study

**Convenience**
recruited from birth records, CO, 1980-1985, 15% of total live twin births

**Size**
306 twins

**Age**
1-4 yrs

**% Male**
N/R

**SES**
Low-middle

**Ethnicity**
95.7% Caucasian, 8.5% Other

**Result**
Heredity of approach/withdrawal was moderate, while environmental influences were near zero.

Key Statistics
- Heritability of Approach/Withdrawal: $h^2 = .60 (07)$, $p < .05$, $c^2 = 0.0$
- Adaptability: $h^2 = .60 (11)$, $p < .05$, $c^2 = 0.0$
- Mood, Negative: $h^2 = .51 (0.20)$, $p < .05$, $c^2 = 0.14$, $n = 14$
- Activity: $h^2 = .05 (0.07)$, $p < .01$, $c^2 = 0.00$
- Intensity $h^2 = .05 (0.06)$, $p < .01$, $c^2 = 0.00$
- $h^2$ = heritability, $c^2$ = shared environment

(Multiple regression model)

Eide, Poirier, et al.

**Year**
1992

**Design**
Concurrent, randomized twin study

**Convenience**
recruited from birth records, CO, 1980-1985, 15% of total live twin births

**Size**
200 twins

**Age**
14+ yrs

**% Male**
41%

**SES**
Middle

**Ethnicity**
N/R

Observations of behavioral inhibition, empathy, and prosocial behavior were moderate genetic influences.

Key Statistics
- Heritability of Behavior: $h^2 = .56 (0.09)$, $p < .05$, $c^2 = 0.0$
- Heritability of Empathy: $h^2 = .36 (0.08)$, $p < .05$, $c^2 = 0.0$
- Heritability of Activity: $h^2 = .05 (0.08)$, $p < .05$, $c^2 = 0.0$
- Heritability of Intensity: $h^2 = .05 (0.06)$, $p < .05$, $c^2 = 0.0$
- $h^2$ = heritability, $c^2$ = shared environment

(Multiple regression model)

Goldsmith, Buss, et al.

**Year**
1997

**Design**
Meta-analysis of 7 studies

**Size**
1,200 twins

**Age**
9.3 yrs

**% Male**
N/R

**SES**
N/R

**Ethnicity**
N/R

Observations of behavioral inhibition, empathy, prosocial behavior, and impulsivity were influenced by moderate genetic effects.

Key Statistics
- Heritability: $h^2 = .59 (0.02)$, $p < .05$, $c^2 = 0.0$
- Heritability: $h^2 = .36 (0.08)$, $p < .05$, $c^2 = 0.0$
- Heritability: $h^2 = .05 (0.08)$, $p < .05$, $c^2 = 0.0$
- Heritability: $h^2 = .05 (0.06)$, $p < .05$, $c^2 = 0.0$
- $h^2$ = heritability, $c^2$ = shared environment

(Multiple regression model)
Family Factors and Processes

This section focuses on children's immediate social environment, including those who live with and influence them on a regular and personal basis. The primary focus is on qualities of family social interaction that either increase or reduce the risk of developing externalizing behavior problems and conduct disorder. These interaction qualities have been categorized into six domains: engagement/attentiveness versus disengagement/inattentiveness; validation versus invalidation; firm discipline and conflict management versus harsh, inconsistent discipline and escalation of conflict; effective problem solving versus ineffective problem solving; structure versus lack of structure in the learning environment; and modeling of norm-maintaining behavior versus modeling of antisocial behavior.

These domains were developed at a level sufficiently general to characterize interaction across development, spanning infancy, toddlerhood, middle childhood, early adolescence, and late adolescence. In many cases, the specific behaviors that reflect a given domain will look quite different across different periods of development, because it is important to take into account the growing sophistication and contributions of the child in family interactions.

It is also important to note that each domain of family interaction is shaped by and responds to a number of other factors that have received considerable attention, such as characteristics of individual family members (attitudes, presence of psychopathology) and characteristics of the social context (family structure and transitions). These factors can exert powerful effects. For example, research on family structure and transitions has shown that adolescents are at increased risk for conduct problems if they live in single-parent families or have experienced multiple transitions in family composition or residence (Arensburger, 1996; Henry, Caspi, Moffitt, & Silva, 1996; Patterson, Forgatch, Yoeger, & Stoolmiller, 1998; Smith & Jarjoura, 1988). The reasons for these effects, however, are not clear. Indeed, some studies have shown these effects to be mediated by more immediate and malleable family processes (e.g., engagement, discipline) (Harnish, Dodge, & Valente, 1995). Although such factors help to identify potential target populations for interventions, the focus of the present review will be on family interaction qualities that either have been shown to be or may be malleable risk processes that would serve as targets for interventions.

Another important context for family interaction is that of culture. Indeed, some argue that processes within the family are the primary means by which culture is expressed. However, there is limited research on cultural differences in family processes related to externalizing behavior problems. The most serious gap is in research with Native American and Asian-American populations. Also, very few studies with diverse samples have included young children (ages 0–5). Finally, available research with African-American and
Hispanic populations is almost exclusively based on low-income, inner-city, high-risk samples. Where available, cultural generalizability and distinctions will be mentioned in the following review of family processes.

The first three domains of interaction—engagement, validation, and discipline/conflict—account for the lion’s share of studies to date. Many of the studies measured more than one aspect of parenting, and there is substantial evidence that engagement, validation, and discipline/conflict tend to correlate with each other. This point has not gone unnoticed in intervention work. It is typical for interventions targeting family processes to emphasize more than one process, such as engagement, validation, and discipline. Research in this area has not tested experimentally the effects of interventions aimed at distinct domains of interaction before building comprehensive preventive interventions.

**Engagement/Attentiveness Versus Disengagement/Inattentiveness**

In infancy and toddlerhood, the concept of engagement has been studied in terms of mother-infant responsiveness and infant attachment security (i.e., quality of the affective bond between infant and caregiver). Evidence indicates that the quality of early parental engagement predicts infant attachment security and that both parental engagement and infant attachment predict the development of early onset externalizing problems (Lyons-Ruth, Alpern, & Repacholi, 1993; Shaw, Keenan, & Vondra, 1994; van den Boom, 1994). Maternal unresponsiveness during infancy has been shown to predict later child externalizing behavior problems (Shaw et al., 1994). Also, there is evidence that avoidant and disorganized attachments during infancy predict later parental and teacher reports of externalizing behavior problems in preschool (Erickson, Sroufe, & Egeland, 1985; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). This result also has been demonstrated among higher risk samples (e.g., low income, parental psychopathology) (Lyons-Ruth et al., 1993).

Additional work indicates that the relationship between parental responsiveness and infant attachment security and child behavior problems may be moderated by child gender and negativity. Several studies have found the impact of maternal responsiveness and attachment security to be more pronounced for boys than girls (Shaw et al., 1994). Other work indicates that it is the combination of infant negative emotionality and attachment security that places children at greater risk for externalizing behavior problems rather than attachment security alone (Shaw et al., 1996).

Several early intervention programs with a primary focus on changing mother-infant responsiveness and engagement have provided evidence suggesting that these early family processes are causal risk factors for child conduct problems. Through intervention, early maternal unresponsiveness can be changed, and this change, in some cases, was related to more secure infant attachment (van den Boom, 1994; van Ijzendoorn, Juffer, & Duyvesteyn, 1995; Wendland-Caro, Piccinini, & Millar, 1999). In addition, a well-known early intervention that included changes in early maternal engagement, validation, and problem solving (in addition to other forms of maternal support) showed long-term effects on reducing conduct problems in adolescence (Olds et al., 1998).

Interestingly, the issues of parental responsiveness and engagement have received less attention in preschool-aged children. The limited research suggests that lack of parental supervision and attention during this period of development predicts increased aggression and delinquency in grade school boys (Haapasalo & Tremblay, 1994).
Similarly, interventions that have addressed parental engagement (as well as validation, discipline, and problem solving) during toddlerhood have been successful in decreasing later childhood externalizing behavior problems (Sheeber & Johnson, 1994; Webster-Stratton, 1998; Webster-Stratton, Kolpacoff, & Hollinsworth, 1988). Thus, evidence exists that parental engagement continues to be a causal risk factor during toddlerhood.

In middle childhood and early adolescence, the concept of engagement has been studied in terms of the amount of time spent with the child, the degree of attentiveness, and monitoring of the child's activities. Consistent evidence indicates that greater involvement, stronger focus of attention, and higher levels of monitoring are related concurrently to lower levels of conduct problems and predict lower risk for developing delinquency or criminal activity (Farrington & Hawkins, 1991; Fridrich & Flannery, 1995). There is some evidence that the lack of parental monitoring may be of particular importance in middle childhood; it was found to be a stronger predictor of early arrests (prior to age 15) than of later arrests (Farrington & Hawkins, 1991; Patterson & Yoerger, 1995). Also, some research indicates possible reciprocal effects between monitoring and delinquency in the period from 13 to 15 years, with weak monitoring promoting delinquency, which, in turn, further erodes monitoring (Jang & Smith, 1997).

Monitoring and involvement continue to show effects on conduct problems into adolescence. During middle and late adolescence, engaged parenting has been related to a reduction in antisocial behavior over time (Aseltine, 1995; Barnes, Farrell, & Banerjee, 1994; Simons, Johnson, Conger, & Elder, 1998). Although the total effect of engagement is low to moderate, the fact that it continues to have a direct impact is important in light of the impact of peer characteristics, personal characteristics, and other environmental factors operating at this period of development. Moreover, even small reductions in rates of serious conduct problems can yield very significant economic, health, and social benefits.

The concurrent and predictive associations of parental engagement during middle childhood and adolescence also are seen in research with African-American and Hispanic families (Forehand, Miller, Dutra, & Chance, 1997; Fridrich & Flannery, 1995). Although the effects range from mild to moderate, the consistency of findings indicates that poor parental engagement is a significant predictive risk factor for youth conduct problems in African-American and Hispanic families. A number of intervention trials have included parental monitoring among the family process variables to target in intervention (Patterson, Chamberlain, & Reid, 1982; Wahler, Cartor, Fleischman, & Lambert, 1993). During middle childhood and adolescence, results of these programs consistently show parental monitoring as a causal risk factor for reducing adolescent conduct problems (Bank, Marlowe, Reid, Patterson, & Weinrott, 1991; Tremblay et al., 1991), with stronger effects found when parents are encouraged to extend their supervision and monitoring to the peer and academic setting (Borduin et al., 1995). Although interventions that include improved parental monitoring also have shown effects for youth already involved in criminal behavior, stronger effects are found in therapeutic foster homes where parental monitoring is enhanced (Chamberlain & Reid, 1998).

**Validation Versus Invalidation**

“Validation” refers to behavior likely to comfort children, increase their sense of security, or communicate that they are valued and valuable. “Invalidation” refers to behavior that is physically painful, increases a sense of insecurity, or communicates to children that they are deficient, defective, or not valuable.
The impact of invalidation has been studied in infants by measuring their response to hostile and rejecting behavior. Evidence consistently shows that such parental behavior is correlated with externalizing behavior problems (Belsky, Hsieh, & Crnic, 1998; Renken, Egeland, Marwinney, Mangelsdorf, & Sroufe, 1989; Shaw et al., 1998). This effect appears to be as robust for girls as for boys, and for middle-SES as well as lower-SES families. It has been found in both European-American and African-American families. In much of the work, parental hostility precedes the onset of externalizing behavior problems. However, some research indicates that parent hostility and rejection may co-occur with child early disruptive behavior and negative emotionality, reflecting a more interactive and mutually escalating parent-child interaction pattern (Shaw et al., 1998).

Parental warmth and hostility continue to show moderate to strong effects during toddlerhood (Campbell, Breaux, Ewing, & Szumowski, 1986; Stocker, 1993) and middle childhood (Metzler, Biglan, Ary, & Li, 1998), and a persistent but lower effect in early adolescence (Conger & Conger, 1994; Conger, Ge, Elder, Lorenz, & Simons, 1994). Parental validation and warmth correlate and predict lower levels of externalizing behavior and delinquency (Feldman & Weinberger, 1994; Scaramella, Conger, & Simons, 1999; Stocker, 1993), while parental hostility, criticism, and rejection correlate with and predict disruptive youth behavior (Campbell et al., 1986; Conger & Conger, 1994). Although the effect sizes tend to be small, parental validation/invalidation has been shown to be a predictive risk factor across African-American, European-American, and Hispanic families (Brody, Stoneman, & Flor, 1996; Harnish et al., 1995; Knight, Virdin, & Roosa, 1994; Lindahl, 1998). Changes in parental warmth that accompany changes in parental engagement, monitoring, and discipline have been shown to lead to reductions in child and adolescent conduct problems (Webster-Stratton, 1998).

As in the case with young children, there is evidence to support interactive effects between parental hostility and middle childhood conduct problems. However, as children move into early adolescence, some evidence suggests that child conduct problems predict reductions in parental warmth but not the converse (Jang & Smith, 1997). Thus, in childhood and adolescence, modest to moderate predictive effects have been documented for parental invalidation and problem behavior. In addition, results of several intervention trials indicate that parental validation, when combined with other family processes, can be modified and serve as a causal risk factor for child and adolescent conduct problems (Borduin et al., 1995; McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991; Patterson et al., 1982; Tremblay et al., 1991; Webster-Stratton, 1998; Webster-Stratton et al., 1988).

**Firm Discipline and Conflict Management Versus Harsh Discipline and Conflict Escalation**

"Firm discipline" refers to parental strategies for managing and controlling child behavior that consistently use rules and set limits, provide reasons for the rules, and offer nonpunitive consequences for rule breaking. "Harsh discipline" refers to nonabusive parental strategies for controlling child behavior that may involve inappropriate or inconsistent use of rules, little reasoning, and punitive or excessively negative reactions to rule breaking. Frequently, these parental strategies are studied within the context of parent-child conflict and the ability to manage calmly and resolve conflicts rather than engaging in coercion and escalating conflict.

As early as age 2, parental use of coercion has been identified as a predictive risk factor for
externalizing behavior problems at school entry (Crockenberg & Lecue, 1996; Fagot & Leve, 1998). Similarly, evidence indicates that negative parental control and harsh parental discipline during toddlerhood predict increased risk for child aggression and externalizing behavior problems one, two, and five years later (Campbell, 1994; Campbell, March, Pierce, Ewing, & Szumowski, 1991; Campbell, Pierce, Moore, Marakovitz, & Newby, 1996). Some of this work has examined the role of early child negative emotionality and finds that both child negativity and parental coercion predict child behavior problems (Kingston & Prior, 1995; Schwartz, Dodge, Pettit, & Bates, 1997).

In middle childhood, and in early and later adolescence, consistent relationships between highly conflictual, inconsistent, harsh, and restrictive parenting and child externalizing, delinquent, and antisocial behavior have been found in research using concurrent correlational designs (Knight et al., 1994; Sampson & Laub, 1994; Shumow, Vandell, & Posner, 1998). Predictive longitudinal studies also indicate that harsh and inconsistent parenting predicts later youth conduct problems (Patterson et al., 1998; Wasserman, Miller, Pinner, & Jaramillo, 1996). However, the direction of this influence may change over time, with a reciprocal relationship between disciplinary style and antisocial behavior in early and middle childhood, but fading reciprocity as the child moves into adolescence (with parental behavior predicting child behavior) (Cohen & Brook, 1995). Also, there is some evidence that the experience of parental punitive discipline may more strongly predict early childhood behavior problems than it does adolescent conduct problems (Feeney, McGee, Stanton, & Silva, 1991). It is important to note, however, that modest to moderate effects of parental discipline and parent-child conflict with externalizing behavior problems still are detected in adolescence (Neighbors, Forehand, & Bau, 1997; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994).

Evidence exists that the effects of parental discipline and conflict management may vary as a function of ethnicity and community context. Several studies have documented concurrent correlations and predictive risk between harsh or inconsistent parental discipline, or both, and child/adolescent conduct problems in African-American and Hispanic samples (Knight et al., 1994; Lindahl, 1998), but other studies have found different effects. For example, harsh discipline had different effects on European-American and African-American children. In a study of children in early elementary school, physical discipline (e.g., spanking) predicted increased externalizing behavior for European-American but not for African-American children (Deater-Deckard, Dodge, Bates, & Pettit, 1996). These differences, however, were significant only in the nonabusive range of corporal punishment; physically abusive parenting is associated with antisocial behavior for both African-American and European-American children (Dodge, Pettit, Bates, & Valente, 1995; Shumow et al., 1998). In adolescence, unilateral parental decision making was related to fewer conduct problems among African-American youth and was unrelated to externalizing behavior problems among European Americans, Hispanics, and Asian Americans (Lamborn, Dornbusch, & Steinberg, 1996).

Parental discipline and conflict management have been primary targets for many intervention programs. These trials have consistently documented that improvement in these aspects of parenting leads to improvements in child and adolescent conduct (Webster-Stratton, 1998). Beginning in toddlerhood, through middle childhood and adolescence, interventions that include improvement in parental discipline, in addition to monitoring and validation, show reductions in youth conduct problems and antisocial behavior (Bank et al., 1991; Patterson, 1995).
et al., 1982; Tremblay et al., 1991; Wahler et al., 1993). For adjudicated youth, improvements in parental discipline have stronger effects on youth conduct when parents are supported to intervene in peer and academic settings outside the home (Borduin et al., 1995). Also, therapeutic foster home placements that emphasize effective parental discipline have shown significant reductions in delinquency among adjudicated youth (Chamberlain & Reid, 1998). Thus, there is substantial evidence that parental discipline and conflict management are causal risk factors for child and youth externalizing behavior problems and conduct problems.

Family Problem Solving

“Family problem solving” refers to behaviors that aid in exploring a given problem and that generate potential solutions. For young children this also includes parental exploration of problems, helping to give structure to the situation and encourage prosocial means of understanding the situation. Although a relatively large body of research has examined basic family problem solving, little of this research has been directed toward understanding externalizing behavior problems. This is striking because many family-based interventions use training in problem solving as part of the intervention package.

The limited work that has been conducted suggests that parental problem solving, from the early years of child development through adolescence, is correlated with less problematic child and adolescent behavior. In early childhood, parental exploration of child emotional experiences, particularly anger and sadness, has been correlated with fewer behavior problems (Hooven, Gottman, & Katz, 1995; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990). There is some evidence that poorer family problem solving in middle childhood may predict later delinquent behavior (Coughlin & Vuchinich, 1996; Vuchinich, Wood, & Vuchinich, 1994). However, it tends to be associated with other problems in parenting (e.g., engagement, discipline) and, in general, accounts for less of the variance in externalizing behavior outcomes than engagement, discipline, and validation. Some research indicates, however, that changes in family problem solving can lead to reductions in child aggression (Sayger, Horne, Walker, & Passmore, 1988).

Parental Structuring of the Learning Environment

Parents and families can structure children’s time in ways that enhance access to learning opportunities in the home, neighborhood, or community and protect children from negative environmental influences. Although this concept is theoretically and practically relevant, there is little research regarding the influence of family structuring of children’s time and activities on externalizing behavior problems.

Research to date, conducted with school-aged children and adolescents, suggests that families that encourage involvement with school and maintain contact with the school have children who show fewer problematic behaviors than do families that are less involved with school (Jenkins, 1997; Ketetizis, Ryan, & Adams, 1998). Also, parents who provide firm discipline and monitoring of their adolescents tend to have children who become involved with peers with similar parental discipline styles (Fletcher, Darling, Steinberg, & Dornbusch, 1995). Being involved in networks of this type appears to be protective against delinquency, because parental monitoring protects against association with deviant peers (Aseltine, 1995). These few findings suggest that parental structuring correlates with child conduct; however, more research is needed to determine the
predictive and possible causal relationship with conduct problems.

**Family Modeling of Norm-Maintaining Versus Antisocial Behavior**

Family modeling of norm-maintaining behavior involves exposing the child to prosocial behavior versus rule-breaking and antisocial behavior by other family members. Three different types of evidence can be used to support the contribution of family modeling in externalizing behavior problems.

A sizable body of literature has examined whether the presence of antisocial behavior, delinquency, or criminal behavior in other family members places children at increased risk for similar behaviors. Much of this work has found increased risk when mothers, fathers, or siblings were rated as more antisocial or had a history of delinquency or criminal behavior (Farrington & Hawkins, 1991). It is not known whether this increased risk stems from modeling; from poorer parental discipline, monitoring, and engagement; or from sharing some common genetic predisposition.

A second body of literature concerns the relationship between marital conflict and child outcomes, where greater marital discord is assumed to model behaviors relevant to externalizing behavior problems in children. Research over three decades documents modest to moderate correlations between parental conflict and children's externalizing behavior problems. Younger and older children appear to be comparably influenced by parental conflict (Brody et al., 1996; Jouriles et al., 1991). Family conflict in more than one area (i.e., parent-parent, parent-child, sibling-sibling) is correlated with child aggression (Schwartz, Dodge, Pettit, & Bates, 1997). This pattern continues to be seen among adolescents, where greater marital discord is modestly correlated with increased delinquency and problem behavior in both boys and girls (Davies & Windle, 1997; Mekos, Hetherington, & Reiss, 1996; Neighbors et al., 1997). Again, it is not clear whether these effects are due to modeling, disruptions in parenting behavior, increased physiological dysregulation, or some combination of these factors.

A third, more poorly documented area of literature focuses on parental values, attitudes, or beliefs concerning deviance and law-abiding behavior. These few studies have found evidence of a correlation between parental antisocial attitudes and externalizing behavior problems/youth offending (Gorman-Smith, Tolan, Loeber, & Henry, 1998). However, additional research is needed to examine these relationships for younger children and to support predictive relationships.

**Implications for Malleable Family Risk Factors and Developmental Processes**

It is clear from the research that a number of aspects of family interaction can increase the risk for developing externalizing behavior problems from early childhood through adolescence. Specifically, lower levels of engagement, greater use of invalidation, and harsh and inconsistent discipline have all been identified as causal risk factors for the development of externalizing behavior problems. Although parental problem solving, structuring of the learning environment, and modeling of normative behavior show some correlation with the development of conduct problems, research on these processes has not advanced to a level where inferences about predictive or causal risk can be made soundly.

It is important to note that the three most frequently studied family processes—engagement,
validation, and discipline—also tend to correlate strongly with one another. This is to say that parents who are less engaged also tend to be less validating and to use harsher and less consistent discipline. Thus, it is not surprising that empirically driven family-focused intervention trials typically target all three processes. These trials have provided evidence for the malleability of these processes and the causal nature of the relationship by demonstrating that intervention can substantially decrease child externalizing behavior problems. Interventions beginning during pregnancy and extending into the second year of life have shown consistent effects on these parenting processes. Indeed, one such early intervention trial has shown long-term effects on serious delinquent behavior during adolescence. Also, a number of randomized trials have tested interventions aimed at families of preschoolers and young children in elementary school. These trials have consistently shown both immediate and longer term reductions in externalizing behavior problems. Similarly, in later childhood and adolescence, randomized trials aimed at family processes have shown effects.

Given these important intervention results, it is imperative that strategies for enhancing family interactions be transported and implemented in community services and mental health practice. Research is needed that identifies opportunities within communities for providing effective interventions, explains how to provide the interventions cost-effectively, and develops community infrastructure and buy-in for sustaining the interventions. In many cases, this process will involve building collaborative relationships with community leaders and policymakers, as well as people in other scientific disciplines such as community psychology, sociology, and social work.

In addition to the effectiveness and dissemination research needed on established risk factors and interventions, further research is needed on the predictive and potentially causal role of family/problem solving, structuring of the learning environment, and family modeling. Do these processes significantly contribute to conduct problems over and above the effects of engagement, validation, and discipline? Are there developmental periods in which some family processes are more influential than others? When family processes are disrupted, does this increase the child’s vulnerability to being affected by factors in other domains, such as characteristics of the child, the peer group, the school, and the neighborhood? This last question is particularly challenging, given the wide array of factors that could be influential at any given time. However, considering these interaction effects—which involve the child, the family, the peer group, and the broader social environment—may prove to be the most insightful for developing interventions for real-world settings.

Whether conducting future research on the effectiveness and dissemination of interventions or studying basic processes of family problem solving, structuring of the learning environment, or modeling, scientists must address cultural issues. The research to date on cultural effects has suggested some interesting distinctions, particularly in the study of parental discipline. It is essential for future research on family processes relevant to conduct problems to include diverse ethnic samples and methodologies sensitive to potential cultural distinctions. These efforts will provide not only a richer empirical understanding of how risk factors are similar or differ across ethnic groups but also a much stronger base on which to develop interventions relevant to the world’s diverse population.
References


### Table 2: Family Factors and Processes—Research Summaries

#### Family Structure and Transitions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age*</th>
<th>% Male</th>
<th>SES**</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hennessy, Casoli, et al.</td>
<td>1996 Prospective longitudinal, 15 yrs</td>
<td>Population: 475</td>
<td>3 &gt; 10 yrs</td>
<td>100%</td>
<td>Low-caste</td>
<td>53%</td>
<td>Cauc. &lt; 7% Māori</td>
<td>Risk for a nonviolent conviction by age 18 was increased by residing in a single-parent family by age 12 &amp; the interaction of age 3-5 lack of control &amp; living with a single parent by age 9. Risk was also increased by the number of resident changes by age 13, lack of control at ages 3-5, &amp; the interaction of lack of control &amp; number of parent changes by age 9.</td>
<td><strong>(4, N = 345) = 15.7, p &lt; .01 main effects</strong>&lt;br/&gt;<strong>(3, N = 345) = 7.8, p &lt; .05 interactions</strong>&lt;br/&gt;<strong>OR = 1.94, r = .66, p &lt; .01 # parent changes</strong>&lt;br/&gt;<strong>M's = .38 nonviolent, .16 no conviction</strong>&lt;br/&gt;<strong>OR = 1.72, r = .55, p &lt; .05 control + single parent</strong>&lt;br/&gt;<strong>Violent Conviction vs. No Conviction</strong>&lt;br/&gt;<strong>(4, N = 315) = 28.3, p &lt; .01 main effects</strong>&lt;br/&gt;<strong>(3, N = 315) = 9.1, p &lt; .05 interactions</strong>&lt;br/&gt;<strong>OR = 1.52, r = .42, p &lt; .05 lack of control</strong>&lt;br/&gt;<strong>OR = 1.33, r = .28, p &lt; .01 # residence changes</strong>&lt;br/&gt;<strong>M's = .31 violent, 1.74 no conviction</strong>&lt;br/&gt;<strong>OR = 1.43, r = .36, p &lt; .05 control + # parent ch</strong>&lt;br/&gt;<strong>(logistic regression analyses)</strong></td>
</tr>
<tr>
<td>Patterson, Foray, et al.</td>
<td>1998 Prospective longitudinal, 10 yrs</td>
<td>Population: 206</td>
<td>9-10 &gt; 18 yrs</td>
<td>100%</td>
<td>Low-middle</td>
<td>615k</td>
<td>N/R</td>
<td>Number of marital transitions: predicted risk for early onset arrest (by age 14) &amp; chronic offending (by age 18), taking into account social disadvantage, effective discipline, &amp; parental monitoring.</td>
<td>Early Onset Arrest (by age 14):<strong>p = .30, p = .006, exp p = 1.66 marital transitions</strong>&lt;br/&gt;<strong>Chronic Offending (by age 18):<strong>p = .42, p = .02, exp p = 1.57 marital transitions</strong>&lt;br/&gt;</strong>(both models: p's &lt; .05; social disadvantage: effective discipline, p's &lt; .10; parental monitoring**&lt;br/&gt;<strong>(logistic regressions)</strong></td>
</tr>
<tr>
<td>Smith &amp; Jarjoura</td>
<td>1988 Concurrent longitudinal</td>
<td>Population: 57</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Violent crime rates (residents reported) were predicted by the interaction of low income (median $5,000) &amp; residential mobility, % single-parent households, population density, &amp; % age 12-20 yrs, taking into account low income, residential mobility (main effects), % nonmale, % living alone, racial heterogeneity, &amp; location.</td>
<td>Violent Crime Rates:<strong>R² = .63</strong>&lt;br/&gt;<strong>p = .002, t = 2.70 mobility &amp; low income</strong>&lt;br/&gt;<strong>p = .07, t = 1.89 % single-parent household</strong>&lt;br/&gt;<strong>p = .52, t = 2.64 population density</strong>&lt;br/&gt;<strong>p = .56, t = 2.91 % ages 12-20</strong>&lt;br/&gt;<strong>(p's = .20; % low income, residential mobility, race, racial heterogeneity, % nonwhite, % living alone)</strong>&lt;br/&gt;<strong>(OLS regressions)</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: Please check "Ethnic Minority Populations" and "Treatment & Preventative Interventions" sections for additional citations.

* = indicates that data at first age are used to predict data at second age.

** Unless otherwise indicated, income is reported in yearly amounts.
### Family Characteristics—Engagement/Disengagement

#### Ages 0–3

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Description</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lyons-Ruth,</td>
<td>1993</td>
<td>Prospective</td>
<td>recruited from infant study of high-risk, low-income families: same-sex classmates, matched on birth date, were controls</td>
<td>Convenience:</td>
<td>62</td>
<td>18 mths &gt;</td>
<td>60%</td>
<td>Low</td>
<td>N/E% AIa</td>
<td>infant attachment security, maternal home-hostile-intrusive behavior during infancy, &amp; maternal history of psychosocial problems* predicted teacher ratings of preschool children's deviant hostile behavior toward peers, contributing to classmate's behavior. Children with disorganized infant attachment were rated more hostile than securely attached.</td>
</tr>
<tr>
<td>Aliper, &amp;</td>
<td></td>
<td>Longitudinal</td>
<td></td>
<td></td>
<td></td>
<td>5 yrs</td>
<td>60%</td>
<td>Low</td>
<td>N/E% AIa</td>
<td></td>
</tr>
<tr>
<td>Repacholi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt; 12 yrs</td>
<td>60%</td>
<td>182</td>
<td>N/E% AIa</td>
<td></td>
</tr>
<tr>
<td>Shaw, Keenan, &amp;</td>
<td>1994</td>
<td>Prospective</td>
<td>recruited from WAC program, metro Pittsburgh, PA, area</td>
<td>Convenience:</td>
<td>82</td>
<td>12 mths &gt;</td>
<td>59%</td>
<td>Low</td>
<td>39% AIa</td>
<td>maternal responsiveness (observed at 12 mths) was correlated with maternal ratings of aggression at age 2 &amp; externalizing at age 3 for boys; but not girls. Multivariate analyses found that maternal responsiveness &amp; infant noncompliance at 18 mths predicted age 2 aggression for boys, after accounting for infant persistence at 12 mths. Maternal responsiveness interacted with boys' aggression at age 2, &amp; marginally predicted maternal ratings of externalizing at age 3. No significant predictors were found for girls.</td>
</tr>
<tr>
<td>Vondra</td>
<td></td>
<td>Longitudinal</td>
<td></td>
<td></td>
<td></td>
<td>3 yrs</td>
<td>73%</td>
<td>&lt; 12 yrs</td>
<td>46% Cau</td>
<td></td>
</tr>
<tr>
<td>Shaw, Owens, et</td>
<td>1996</td>
<td>Prospective</td>
<td>recruited from WAC program, metro Pittsburgh, PA, area</td>
<td>Convenience:</td>
<td>77</td>
<td>12 mths &gt;</td>
<td>59%</td>
<td>Low</td>
<td>39% AIa</td>
<td>aggression at age 5 was predicted by observed infant difficulty at 12 mths, maternal ratings of infant difficulty during year 2, &amp; the attachment by difficulty interaction. Children exhibiting disorganized attachment and high difficulty had higher aggression scores than children with 1 or neither risk factor.</td>
</tr>
<tr>
<td>al.</td>
<td></td>
<td>Longitudinal</td>
<td></td>
<td></td>
<td></td>
<td>5 yrs</td>
<td>73%</td>
<td>&lt; 12 yrs</td>
<td>61% Cau</td>
<td></td>
</tr>
</tbody>
</table>

#### Key Statistics

- **Hostility** $F = 3.36, p = .04$
- **Risk** $F = 5.32, p = .008$
- **Risk** $F = .56, p = .23$ secure, $p < .09$

- **Compliance** $F = 3.55, p = .04$
- **Risk** $F = 4.30, AA = 5.59$ secure, $p = .06$

- **Wisconsin** $F = 1.36, p < .04$
- **Risk** $F = 1.36, p < .05$

- **F $= .31, p < .05$ maternal psychological problems**
- **F $= .34, p < .05$ maternal hostile-intrusive behavior**
- **(contrasting for classmate behavior score)**
- **(multiple regression, ANOVA or Chi-square)**

- **Infant Attachment Security, Disorganized vs. Secure** $F(1, N = 50) = 6.20, p < .01, a = .40$
- **51% nondeviant, 9% deviant secure**
- **96% nondeviant, 4% deviant disorganized (Chi-square)**

- **Aggression Age 1, Maternal Responsiveness 12 Mths** $r = -.32, p < .05$ boys, $r = .04, p = .05$ girls

- **Multivariate, Boys** $F(3, 41) = 4.09, p < .02$
- **Maternal responsiveness 12 mths** $R^2 = .23, a R^2 = .09, F(3, 41) = 4.09, p < .04$
- **(p < .05; infant noncompliance, p < .10; persistence)**

- **Externalizing Age 3, Maternal Responsiveness 13 Mths** $r = -.29, p < .05$ boys, $r = -.05, p = .05$ girls

- **Multivariate, Boys** $F(3, 35) = 4.85, p < .03$

- **Maternal response 12 mths = aggression age 2** $R^2 = .30, a R^2 = .07, F(3, 35) = 4.85, p < .08$

- **Global aggression 12 mths** $R^2 = .20, a R^2 = .20, F(1, 37) = 8.88, p = .005$

- **(p < .10 maternal responsiveness)**

- **Hierarchical multiple regression**

- **Aggression Age 5, F(3, 72) = 7.94, p < .001**

- **a R^2 = .11, p < .003 infant difficulty yr 1**
- **b R^2 = .10, p < .02 infant difficulty yr 2**
- **c R^2 = .06, p < .02 disorganized attachment y 1**
- **d R^2 = .07, p < .02 disorganized attachment**
- **e = 8.27, p < .001 interaction**
- **M = 72.0 disorganized attachment & Mdn infant difficulty**
- **M = 59.7 above Mdn infant difficulty**
- **M = 57.5 disorganized attachment**
- **M = 58.1 neither risk factor**

- **(stepwise multiple regression, ANOVA)**
### Family Characteristics—Engagement/Disengagement

#### Ages 0–3

**Authors:** Van der Boom 1994  
**Year Design:** Intervention random assignment, followup 2 attachment  
**Representativeness:** Source specific: low SES families through birth registry & enrolment in Leiden, Netherlands, area; selected firstborn infants, high on immaturity; IV took place at home, three-three two-three sessions over 3 months  
**Size:** 6 dyads > 9, 12 months  
**Age:** 6 months; % Male: 47%  
**SES:** Low  
**Ethnicity:** 100% Cau” (Netherlands)  
**Result:** Compared to controls, dyads in the maternal responsiveness intervention group showed effects on maternal & infant interactions (mother more responsive, visually attentive, stimulating, controlling of behaviors while infants more self-soothing, leaning, & exploring), infant exploration (more sophisticated examining & less mouthings), & infant attachment (IV group more likely to be securely than insecurely attached at 15 months).  
**Key Statistics:** Infant Interactive Behavior, Responsiveness  
1. F(1, 96) = 176.8, p < .001; M’s = 4.3 IV, 1.8 CTT (p = < .001)  
2. Infant Exploring, Mentoring  
3. F(1, 96) = 4.61, p < .05; M’s = 3.1 IV, 3.1 CTT (p = < .001)  
**Quality of Attachment:** (1) = 16.96, p < .001  
38% IV, 78% CTT insecure; 42% IV, 28% CTT secure  

#### Ages 4–6

**Kapczinski & Tremblay 1994 Prospective longitudinal 8 yrs**  
**Population:** boys in 52 public schools in low-SES area, Montreal, Canada rated by kindergarten teachers: only boys with Canadian-born, French-speaking parents, < 15 yrs old eligible  
**Size:** 948 boys > 6 yrs, > 14 yrs  
**Age:** 100% Low  
**M = 211 (US) (French Canadian)**  
**M = 10.5 yrs maternal age**  
**Ethnicity:** Boys classified as nonfighters from ages 5–12 reported more supervision, less punishment, fewer rules at ages 10–12 than fighters. High supervision, low conflict between ages 10–12, low punishment, & low family adversity reduced the likelihood of being involved in delinquency at age 13 & 14.  

#### Ages 7–13

**Perring & Hawkins 1991 Prospective longitudinal 24 yrs**  
**Population:** samples all boys ages 9–16 from 6 state primary & 1 special school, working-class area of London, 1981–1982  
**Size:** 411 boys > 8 yrs, > 32 yrs  
**Age:** 100% Low  
**M = 211 (US) (French Canadian)**  
**M = 10.5 yrs maternal age**  
**Ethnicity:** Low paternal involvement in leisure activities ages 8–12 was the strongest predictor of early convictions (10–13) & persistence of offending between ages 21 & 32. High social disorganization, authoritarian parents, poor psychomotor skills, & convicted parent also predicted early convictions while heavy drinking, low commitment to school, poor housing, low verbal IQ, & unemployment predicted persistence. Parental supervision increased the likelihood of a criminal conviction.  

#### Jang & Smith 1997 Prospective longitudinal 1.5 yrs  
**Population:** selected from all 70% 2nd graders  
**Size:** 99–10th gr, 50% 9th–10th gr, 50% 11th–12th gr  
**Age:** 14 yrs  
**Ethnicity:** 75%  
**N/R:** Parental supervision was associated with lower delinquency at time 1 & change in delinquency between times 1 & 2. Delinquency at time 1 was associated with reduced change in perceived supervision between times 1 & 2. The model included effect at times 1 & 2.  

**Key Statistics:** Infant Interactive Behavior, Responsiveness  
1. F(1, 96) = 176.8, p < .001; M’s = 4.3 IV, 1.8 CTT (p = < .001)  
2. Infant Exploring, Mentoring  
3. F(1, 96) = 4.61, p < .05; M’s = 3.1 IV, 3.1 CTT (p = < .001)  
**Quality of Attachment:** (1) = 16.96, p < .001  
38% IV, 78% CTT insecure; 42% IV, 28% CTT secure  

*(New study for additional results)*  

**(2 x 2 MANOVAs, log linear analyses)**
### Family Characteristics—Engagement/Disengagement

**Ages 7–13**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population:</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>% Male</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patterson &amp; Yaeger</td>
<td>1995</td>
<td>Prospective longitudinal</td>
<td>recruited from 2 birth cohorts of all 4th-grade boys attending randomly selected schools in 10 neighborhoods with highest delinquency rates, metro area, mistake OR city</td>
<td>206</td>
<td>10–11–14 yrs</td>
<td>100%</td>
<td>Low</td>
<td>69%</td>
<td>$15K</td>
<td>33% unemployed</td>
<td>1%</td>
<td>Poor parental monitoring predicted early arrest (ages 10–14). Monitoring did not predict early arrest when antisocial behavior, SES, parent transitions, discipline, unsupervised time, &amp; deviant peers were taken into account.</td>
<td></td>
</tr>
</tbody>
</table>

**Ages 14–19**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population:</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>% Male</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asefazadeh</td>
<td>1995</td>
<td>Prospective longitudinal</td>
<td>Convenience sample of 9th–11th graders from the only public high schools in 3 communities, Boston, MA, metro area</td>
<td>435</td>
<td>9th–11th gr</td>
<td>110–120 yrs</td>
<td>Low-medium</td>
<td>43%</td>
<td>$37K–$66K</td>
<td>17%</td>
<td>&lt; 2% AA &amp; AAPIA</td>
<td>4%</td>
<td>According to high school youths' self-reports, delinquency at time 1 predicted lower attachment to mother &amp; father 1 yr later (time 2), &amp; attachment to mother at time 2 was associated with less delinquency the following year (time 3). Parental monitoring at time 2 was associated with reduced exposure to delinquent peers at time 3.</td>
</tr>
</tbody>
</table>

**Barnes, Farrell, & Banerjee** | 1994 Prospective longitudinal | 658 | 12–15 yrs | Low-middle | 45% | $37K.5k | African-American | 30% | AA & Caucasian | 30% | Adolescents' reports of parental monitoring, mother support, & positive communication with mother were associated with fewer deviant behaviors 1 yr later, after accounting for race, gender, age, parents' substance abuse, family structure, mother's education, family income, youth religiosity, & religiosity. |

**Simons, Johnson, et al.** | 1998 Prospective longitudinal | 179 | 7th–9th gr | Low-upper | 100% | $20,642 | (40–$65,000) | M = 13.5 yrs | 100% | Caucasian | 100% | Youths' reports of quality parenting (low hostility & high cooperation, discipline, high monitoring, & consistency) mediated the relationship between observed & parent-reported oppositional defiant behavior in late childhood & self-reports of delinquency in early adolescence. High-quality parenting led to a relative decline in problem behavior over time, taking into account deviant peers. |

**Key Statistics**

- Parental Monitoring & Early Arrest, Ages 10–14
  - Univariate & Multivariate $p = .04$, $p < .01$
  - Parental monitoring $p = .05$, $p < .001$
  - Antisocial behavior $p = .50$, $p < .001$
  - Parental transitions ($\text{OR} < .05$)
Family Characteristics—Engagement/Disengagement Ethnic Minority Populations

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>% Male</th>
<th>SES</th>
<th>Paternal Factor</th>
<th>Result</th>
</tr>
</thead>
</table>
| Forehand et al.  | 1997 | Concurrent                 | Convenience                      | 907         | 14-16 yrs | 43%    | Low | 47% 4th      | Low parental monitoring (combined parent & child ratings) & being male 
associated with higher levels of report-of-deviance in four samples: African-American adolescents, 
Montgomery, AL; & Bronx, NY; Hispanic adolescents, 
San Juan, PR; & The Bronx, NY. Older age was related to more deviance 
for NY youth. Other variables included parental communication, 
maternal education, marital status, residence in city, income, 
parenting by age, gender interactions. Ethnic/geographical differences were found for parenting, deviance, & all 
of the demographic control variables. Hispanic families from San Juan had 
the highest levels of paternal monitoring & the lowest levels of 
self-reported deviance. |

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Convenience</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>% Male</th>
<th>SES</th>
<th>Paternal Factor</th>
<th>Result</th>
</tr>
</thead>
</table>
| & Flannery       | 1995 | Concurrent                 | recruited from all 
7th & 8th graders 
in 3 schools, 1 school 
district, middle 
Southwestern city; 
o ESL classes; 81% 
residential rate | 1,021       | 7th & 8th gr | 52%     | Low-middle 
from across 
track data: 
M = $32,272 
($17K-$48K) (Mexican-Am) | 63% Cau | 24% Hsp | 13% N/R | Parental monitoring had a direct 
negative effect on delinquency for 
Caucasian youth. Susceptibility to 
antisocial peer pressure mediated 
the relationship between youths' 
reports of parental monitoring & 
delinquency for Caucasian & Mexican-
American youths. Mexican-American youths 
reported greater susceptibility to 
antisocial peer pressure & more 
delinquency than Caucasian youths; 
reports of parental monitoring did 
not differ. When acculturation* was 
examined, parental monitoring was 
higher for recent immigrants than for 
acculturated Mexican-American 
youths. Only acculturated Mexican-
American youths reported more 
delinquency than Caucasian youths.* 
"Acculturated" parents born in U.S., 
speak Eng, Unacculturated by Choice: 
parents born in U.S., speak Spanish; 
Unacculturated Recent Immigrant: 
parents born in Mexico, speak Span

<table>
<thead>
<tr>
<th>Key Statistics</th>
<th></th>
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<th></th>
</tr>
</thead>
</table>
| African-American, Montgomery, AL |  b = 35, unique R² = 12 | gender                        |  b = -31, unique R² = 0.07 | parent monitoring
| African-American, Bronx, NY |  b = 17, unique R² = 0.03 | adolescent age                |  b = .25, unique R² = 0.04 | gender
| Hispanic, Bronx, NY |  b = .33, unique R² = 0.11 | adolescent age                |  b = .20, unique R² = 0.04 | gender
| Hispanic, San Juan, PR |  b = .40, unique R² = 0.16 | gender                        |  b = -29, unique R² = 0.06 | parent monitoring

| Ethnic Group Differences   | Parent monitoring M's = 24.4, 24.4, 35.5, 24.9 | Child deviance M's = 1.0, 1.0, 1.0, 1.0 (order of M's: Hisp, San Juan & Bronx, African-Am, AL & Bron; M's with different letters differ p < .05) (ANOVA, Student Newman-Keuls, chi-square) |
## Family Characteristics—Engagement/Disengagement

### Treatment & Preventative Interventions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample/Intercept</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>O'Leary et al.</td>
<td>1996</td>
<td>Intervention random assignment</td>
<td>Recruited pregnant women from 2 clinics &amp; private obstetricians, semi-rural, part of upstate NY</td>
<td>315</td>
<td>52%</td>
<td>Low-middle</td>
<td>88% Caucasian</td>
<td>Adolescents whose mothers received prenatal or pre-postnatal nurse visits at home. In addition to prenatal &amp; well-child care had fewer arrests &amp; conviction/probation violations than adolescents whose mothers were in the comparison group (prenatal &amp; well-child care without nurse visits). Intervention effects were found for subsample of low SES, unmarried mothers as well. Intervention groups did not differ on parent, child, or teacher reports of adolescents' behavior problems. The intervention targeted parental engagement, validation, &amp; problem solving.</td>
</tr>
<tr>
<td>Sweeney &amp; Johnson</td>
<td>1994</td>
<td>Intervention random assignment 2-mo followup</td>
<td>Recruit mothers of children with difficult temperaments who were having difficulties with parenting; recruited mothers by (1) flyer in preschool (selected for proximity &amp; range of SES) &amp; (2) ads in local newspaper; screened out for psychiatric, psychological, maternal or child receiving treatment</td>
<td>40</td>
<td>3-5 yrs</td>
<td>60%</td>
<td>Middle</td>
<td>Mothers of temperamentally difficult children who attended a temperament-focused parent-training group reported fewer child behavior problems &amp; greater attachment to their children at post-treatment &amp; 2-mo followup compared to wait-list controls.</td>
</tr>
<tr>
<td>van Ijzendorn &amp; Juffer</td>
<td>1995</td>
<td>Meta-analysis 11-months sensitivity</td>
<td>Include families, adopted, first-child, older 32-154 months; small network, anxious, low SES, &amp; foster</td>
<td>869</td>
<td>N/R</td>
<td>Low-middle</td>
<td>N/R</td>
<td>Parental Sensitivity</td>
</tr>
</tbody>
</table>

### Key Statistics

- **Total Sample, Arrests:**
  - p = .005 for preg & tx infant
  - M = .36, .18, .26, .17 for infant

- **Total Sample, Convictions:**
  - p = .011 for preg & tx infant
  - M = .27, .06, .08, .10 for tx infant

- **High Risk, Low SES & Unmarried, Arrests:**
  - p = .02 for preg, .03 for infant
  - M = .35, .13, .15, .29 for tx infant

- **High Risk, Low SES & Unmarried, Convictions:**
  - p = .001 for preg & tx infant
  - M = .47, .07, .09 for tx infant

(statistics not reported)

- **tx preg = nurse visit during pregnancy**
- **tx infant = nurse visit during pregnancy & infancy**

**Note:**
- All studies included in the analysis were conducted in the United States. The interventions varied in their focus, with some targeting parents directly, while others focused on the child and family as a whole. The outcomes assessed included parental engagement, child behavior problems, and arrest and conviction rates. The interventions were found to be effective in reducing these rates and improving family functioning.
### Family Characteristics - Engagement/Disengagement: Treatment & Preventative Interventions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wondra-Card,</td>
<td>1999</td>
<td>Intervention</td>
<td>Convenience</td>
<td>36</td>
<td>2-5</td>
<td>44%</td>
<td>Low</td>
<td>100% Brazil</td>
<td>Mothers of newborns who took part in an intervention designed to increase sensitivity showed greater responsiveness to infant vocalizing &amp; looking at mother &amp; less unresponsiveness to infant cries, vocalizations, &amp; involuntary behaviors during home observations at 1 mth of age, compared to mothers in the control group who had received basic caregiving instructions. Maternal education, paternal occupation, &amp; infant birth weight were controlled.</td>
</tr>
<tr>
<td>Pizzini, &amp; Miller</td>
<td></td>
<td>random assignment</td>
<td>Volunteer mothers &amp; their newborns, Porto Alegre, Brazil</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Validation/Invalidation - Ages 0-3

<table>
<thead>
<tr>
<th>Benyon, M. &amp; Crici</th>
<th>1998</th>
<th>Prospective longitudinal study</th>
<th>Convenience: recruited from birth announcements, semi-urban university town, central PA, firstborn son from intact families</th>
<th>125</th>
<th>10 mths &gt;</th>
<th>100%</th>
<th>Low-upper</th>
<th>100% Care</th>
<th>Observed negative mothering (intrusiveness &amp; negative affect), during the 2nd &amp; 3rd yrs of life predicted age 3 parent reports of externalizing problems for highly negative infant boys. Positive mothering was not related to externalizing.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37 mths</td>
<td></td>
<td>M = 94 (65-108)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Key Statistics

- **Ages 0-3:**
  - Negative Mothering, 2nd Year
    - $R^2 = 0.73, \alpha R^2 = 0.45, \alpha F = 4.57, p < .05$
    - $p = .07, p = ns$
  - Negative Mothering, 3rd Year
    - $R^2 = 0.57, \alpha R^2 = 0.46, \alpha F = 5.46, p < .05$
    - $p = .60, p < .05$
  - $(p/\alpha = rs, \alpha = positive mothering, (regression))$

- **Aggression, Teacher Ratings, Boys:**
  - $R^2 = 0.33, F (5, 65) = 3.62$
  - Developmental history set (attachment & affect): $R^2 = 0.17, F (4, 91) = 4.69, p < .05$
  - Maternal hostility set $R^2 = 0.19, \alpha F = 0.02, F (2, 97) = 11.73, p < .01$
  - Life stress set $R^2 = 0.18, \alpha F = 0.63, F (3, 74) = 5.28, p < .01$

- **Aggression, Teacher Ratings, Girls:**
  - $R^2 = 0.25, F (9, 94) = 2.05, p < .05$
  - Developmental history set (attachment & affect): $R^2 = 0.08, F (4, 70) = 1.60, p < .18$
  - Maternal hostility set $R^2 = 0.11, \alpha F = 0.54, F (2, 77) = 4.83, p < .05$
  - Life stress set $R^2 = 0.17, \alpha F = 0.54, F (3, 56) = 3.01, p < .03$
  - attachment = avoidant, affect = negative affect (multiple regressions with sets)
**Family Characteristics—Validation/Invalidation**

### Ages 0–3

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaw, Winslow, et al.</td>
<td>1998</td>
<td>Prospective longitudinal</td>
<td>Convenience: high-risk mothers in WIC Nutritional Supplement Program, metro area of Pittsburgh, PA, cohort 2</td>
<td>103</td>
<td>12 mths &gt; 3.5 yrs</td>
<td>59%</td>
<td>Low</td>
<td>39% AHA &lt; 4% AsIA &amp; 57% Cauc &lt; 4% Hisp</td>
<td>For boys, age 1 high maternal responsiveness &amp; age 2 maternal rejection predicted age 3.5 maternal reports of child externalizing. For boys, age 2 maternal rejection &amp; child noncompliance predicted mother-rated externalizing at 3.5 yrs, accounting for age 2 externalizing. For girls, the interaction of maternal rejection &amp; child noncompliance predicted mother-rated externalizing at 3.5 yrs, accounting for age 2 externalizing.</td>
<td>Externalizing Age 3.5, Boys, Mother Report Overall F (7, 76) = 3.57, p &lt; .003 R² = .20, ΔR² = .06, p = .007 R² = -.24, ΔR² = .06, p &lt; .01 Mdn = 59 high response, high rejection, boy Mdn = 44 high response, low rejection, boy Mdn = 45 low response, high rejection, boy Mdn = 57.5 high noncomp, hi rejection, boy Mdn = 45 low noncomp, hi rejection, boy Mdn = 45 low noncomp, hi rejection, girl (Hierarchical multiple regressions)</td>
</tr>
<tr>
<td>Campbell, Breau, et al.</td>
<td>1994</td>
<td>Prospective longitudinal</td>
<td>Source specific convenience: recruited parents of children with behavior problems &amp; nonsymptomatic controls from doctor's offices &amp; child groups</td>
<td>51-63</td>
<td>M = 36 &gt; M = 48 &gt; M = 73 &gt; N/R = 60% Low-upper</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Child Aggression Predicted by Maternal Behavior Age 3 (n = 63) R = .55, ΔR² = .36, F = 5.01, p &lt; .05</td>
<td></td>
</tr>
<tr>
<td>Stacker</td>
<td>1993</td>
<td>Concurrent sampled data collected over 3 yrs.</td>
<td>Convenience: McNemar's sample pairs of families from the Colorado Adoption Project; sampling method not reported</td>
<td>54</td>
<td>8.1 yrs</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Positive maternal affection was associated with less externalizing for both older &amp; younger siblings according to mother reports. Younger siblings who had less positive affection from their mothers at the same or different age as their older siblings had higher levels of externalizing.</td>
<td>Externalizing &amp; Positive Maternal Affection Older sibling: r = -.32, p &lt; .05 Younger sibling: r = -.41, p &lt; .05</td>
</tr>
<tr>
<td>Conger, Ge, et al.</td>
<td>1994</td>
<td>Prospective longitudinal</td>
<td>Population: recruited from all 7th graders in all public &amp; private schools in all towns &gt; 6,500; 82% rural counties; Iowa, 1989; region had experienced economic decline</td>
<td>378</td>
<td>M = 12.6 yrs</td>
<td>48% Low-middle-middle</td>
<td>100% Cauc</td>
<td>Maternal &amp; paternal hostility toward the adolescent mediated the relationship between parent-adolescent conflict &amp; adolescent externalizing for boys &amp; girls.</td>
<td>Mother Model: y² (138) = 251.5, GFI = .932 R² = .55 parent hostility—externalizing R² = .46 financial conflict—parent hostility Father Model: y² (138) = 227.0, GFI = .941 R² = .35 parent hostility—externalizing R² = .45 financial conflict—parent hostility (p &lt; .05; p = ns: financial conflict—externalizing) (Structural equation models)</td>
<td></td>
</tr>
<tr>
<td>Family Characteristics—Validation/Invalidation</td>
<td>Ages 7–13</td>
<td></td>
<td>Ages 14–19</td>
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<tr>
<td>Authors</td>
<td>Jang &amp; Smith</td>
<td></td>
<td>Conner &amp; Conner</td>
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<tr>
<td>Year Design</td>
<td>1997 Prospective longitudinal 1.5 yrs</td>
<td></td>
<td>1994 Prospective longitudinal 2 yrs</td>
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<tr>
<td>Representativeness</td>
<td>Recruited from all 7th &amp; 8th graders in public schools, Rochester, NY; oversampled high-risk youth in high crime areas</td>
<td></td>
<td>Recruited from all 7th &amp; 8th graders, public schools, communities of 5,000, 8 counties, in North central Iowa, 1999; all 2-parent families</td>
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<tr>
<td>Population</td>
<td>Convenience sampling</td>
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<td>Convenience sampling</td>
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<tr>
<td>Size</td>
<td>836</td>
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<tr>
<td>% Male</td>
<td>75%</td>
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<td>68%</td>
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<tr>
<td>SES</td>
<td>NA</td>
<td></td>
<td>Mdn = 15 yrs</td>
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<tr>
<td>Ethnicity</td>
<td>NA/N/R</td>
<td></td>
<td>Mdn = 15 yrs</td>
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<tr>
<td>Result</td>
<td>Child-reported affective ties to parents in 7th/8th grade were not associated with child-reported changes in delinquency in 9th/10th grade; however, delinquency in 7th/8th grade predicted lower affective ties in 9th/10th grade. Affective ties &amp; delinquency were not related concurrently at T1 or T2. The model included parent-child supervision at T1 &amp; T2.</td>
<td></td>
<td>The sibling treated as the most hostile by the mother or father reported the greatest increase in delinquency from early to mid-adolescence.</td>
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<tr>
<td>Key Statistics</td>
<td>$s^2 = 260.67, df = 113, p &lt; .001, GFI = .972</td>
<td></td>
<td>Father $\gamma^2(5, N = 359) = 11.92, AGFI = .954</td>
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<tr>
<td></td>
<td>$r = n/a</td>
<td>Positive Family Relations &amp; Antisocial Behavior</td>
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<tr>
<td></td>
<td>$r = -.17, p &lt; .05$</td>
<td>Positive Reinforcement &amp; Antisocial Behavior</td>
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<tr>
<td></td>
<td>$r = .04, p = .05$</td>
<td>Positive Family Relations &amp; Antisocial Behavior</td>
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*trust, warmth, fun, lapromising (multivariate structural equation model)

**latent variable structural equation models**

- Parenting, Family Functioning, & Delinquency
- $r = -.33, p < .05$ effective parenting referred to the 10th grade; $r = -.37, p < .01$ family functioning referred to the 10th grade.
- $\beta = -.55, p < .001$ effective parent T1 → restraint T1
- $\beta = -.37, p < .05$ restraint T2 → delinquency T2
- $\beta = -.39, p < .05$ family functioning T1 → restraint T2
- $\beta = -.39, p < .01$ restraint T2 → delinquency T2
- Mother Parenting Model
- $\beta = .40, p < .01$ effective parent T1 → restraint T2
- $\beta = .32, p < .05$ restraint T1 → restraint T2
- $\beta = .34, p < .05$ restraint T2 → delinquency T2
- $\beta = -.33, p < .05$ family functioning T1 → delinquency T2

(path analysis, least squares regression analyses)
Family Characteristics—Validation/Invalidation
Ages 14–19

Authors: Scaramella, & Simons
Year: 1999
Design: Prospective

Population: recruited from all 7th-grade students in 39 public & private schools in communities in central Iowa, & community contacts in rural areas

Results: Adolescents whose parents were above the median on warmth & low hostility reported lower levels of externalizing each year from 8th to 12th grade, & higher rates of growth in externalizing over this time than adolescents of parents below the median.

Key Statistics:
- \( \eta^2 = .39 \), \( F(1, 12) = 8.56, p < .01 \) (parent warmth)
- \( \eta^2 = .49 \), \( F(1, 12) = 13.55, p < .001 \) (low hostility)

Repeated Measures:
- Parental warmth \( F(3, 12) = 2.97, p < .05 \)
- Linear \( F(1, 12) = 5.99, p < .01 \)

Law hostility \( F(3, 12) = 2.16, p < .10 \)
- Linear \( F(1, 12) = 3.83, p < .01 \)

Ethnic Minority Populations

Brody, 1996
Concurrent

Population: 2-parent families with 10-year-old children ages 9–12 were recruited from schools, churches, & community contacts in rural areas (population under 2,500) CA & SC

Hamlin, 1995
Concurrent

Population: selected kindergarten children & their parents from schools with high-risk populations; no father-only households; representative of schools distribution on race, gender, behavior problems; Durham, NC, Nashville, TN, central PA, & Seattle, WA

Ethnic Group Differences
- Maternal depression & mother-child interactions \( \chi^2(1) = 8.80, p < .01 \)
- African American
- Caucasians (chi-square, bivariate correlations)
### Family Characteristics—Validation/Invalidation

#### Ethnic Minority Populations

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knight, Vinik, &amp; Rossa</td>
<td>1994</td>
<td>Concurrent</td>
<td>231</td>
<td>9-15 yrs</td>
<td>N/R</td>
<td>Low</td>
<td>Caucasian: M = 12-14 yrs</td>
<td>Mother &amp; child (M/Ch) reports of maternal rejection were associated with lower mother &amp; child reports of conduct disorder, while M/Ch reports of maternal rejection were associated with higher M/Ch.</td>
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<td>35-54</td>
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<td>Mexican Am: M = $10k-$15k</td>
<td>Rejection &amp; Conduct Disorder</td>
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<td></td>
<td>M's = 11-16 yrs</td>
<td>* (groups differ p &lt; .05)</td>
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<td></td>
<td></td>
<td>parents ed</td>
<td>(Mexican Am)</td>
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</tbody>
</table>

#### Lindahl

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<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
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<tbody>
<tr>
<td></td>
<td>1998</td>
<td>Concurrent</td>
<td>110</td>
<td>7-11 yrs</td>
<td>100%</td>
<td>Low</td>
<td>African/American: M = 30%</td>
<td>Ethnic groups were represented equally across diagnostic &amp; control groups. According to parent reports &amp; observations, family cohesion was lowest for families of children diagnosed with oppositional defiant disorder (ODD), followed by those diagnosed with both ODD and ADHD, followed by those diagnosed with ADHD alone, then by control families. Parental support (parents' reports &amp; observations) was lower for families of children with ODD and ADHD than controls. Parental rejection—control was higher for the 3 clinical groups than control group families. Analyses controlled for family income.</td>
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<td>36% Caus</td>
<td>Parent rejection—control was higher for the 3 clinical groups than control group families. Analyses controlled for family income.</td>
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<td></td>
<td>57% Hip Am</td>
<td>*Caribbean Am included</td>
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</table>

**Key Statistics**

- **Acceptance & Conduct Disorder**
  - F = 11.9, p < .001, M's = 1.95, 1.49 Max Am

- **Ethnic Group by Diagnostic Category**
  - F (3, 165) = 4.44, p = ns
  - Multivariate F (21, 218) = 4.43, p < .001
  - Cohesion:
    - F (1, 165) = 37.76, p < .001
    - M's = .54, .43, t = -1.22, p = .06
  - Parental support:
    - F (3, 165) = 8.05, p < .001
    - M's = 3.33, control, p = .14
  - Parent rejection—control:
    - F (3, 165) = 25.27, p < .001
    - M's = 1.45, 3.2, 3.05, 3.46, p = .05
    - (M's with different letters differ p < .05)
  - Co = correlated ODD & ADHD
  - MANOVA, family income covariate, univariate tests with Box-Fisher correction, chi-square
## Family Characteristics—Validation/Invalidation Treatment & Preventative Interventions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Intervention</th>
<th>Research Design</th>
<th>Treatment/Preventative Interventions</th>
<th>Year</th>
<th>Source Specificity</th>
<th>Sample Size</th>
<th>Gender</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Webber, Stratton</td>
<td>1998 random</td>
<td>Intervention</td>
<td>Source specific</td>
<td>recruited families entering Head Start, 9 centers in 1 urban district; 2 cohorts, fall 1993 &amp; 1994; Seattle, WA</td>
<td>206</td>
<td>M = 56.5 yrs</td>
<td>53% Female</td>
<td>17% AB/A</td>
<td>Low</td>
<td>4% Asian</td>
<td>Families who attended a parent-training intervention in addition to Head Start showed greater improvements in maternal parenting and child behavior than families in Head Start alone. During home observations, intervention group mothers were less negative, harsh, critical, and displayed more positive affect than control mothers, while intervention group children had a greater reduction of problem behaviors, negativity, &amp; noncompliance than control children. All improvements were maintained after 1 yr.</td>
<td>Mother, marital quality, observed F = 7.72, p &lt; 0.01 (pre-post)</td>
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</tbody>
</table>

| Webber, Stratton, Kolaocoff, & Hollworth | 1998 random | Intervention | Source Specific: Families of children (3-8 yrs) | Each of the three treatment groups, YM, GD, & GDM, showed improvement in mother & child behavior reported by mothers & father parents (OBSERVED) | 114  | M = 4.5 yrs | 69% Low-upper | 12% 1 | 21% 2 | 23% 4 | 15% 5 | Hollingshead Each of the three treatment groups, YM, GD, & GDM, showed improvement in mother & child behavior reported by mothers & father parents (OBSERVED) | Father-Criticism, Observed F = 4.01 IVM & 4.27 GDM (vs. GDM, p < 0.01) F = 2.37, p < 0.05 GD vs. CH (pre-post) F = 7.75 YM, 2.65 GDM (vs. CH), p < 0.01 | M = 61.9; 7.96 YM; 33.24; 31.07 GDM | M = 48.3, 34.30 GD; 32.77, 46.48 control F = 2.37, p < 0.05 GD vs. CH (pre-post) | M = 13.41, 7.78 YM; 19.75, 8.00 GDM | M = 19.96, 8.14 GD; 11.0, 12.07 control (see study for other significant results) (MANOVA, ANOVA) |
### Family Characteristics—Discipline and Conflict

#### Ages 0–3

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cockenberg &amp; Lourie</td>
<td>1996</td>
<td>Prospective longitudinal/ concurrent</td>
<td>N/R 4 yrs</td>
<td>48%</td>
<td>62% mother, 69% fathers</td>
<td>42</td>
<td>2–6 yrs</td>
<td>7% HISP</td>
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#### Ages 4–6

<table>
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<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fagot &amp; Lave</td>
<td>1998</td>
<td>Prospective longitudinal 3.5 yrs</td>
<td>Convenience: 122</td>
<td>53%</td>
<td>Low-middle</td>
<td>2% APA, 1% ANA</td>
<td>Parent coerciveness at age 2 predicted teacher ratings of age 5 externalizing, taking into account family structure &amp; negative child behavior in play group (observed), attachment, temperament, negative behavior at home, parent ratings of externalizing, gender, income, contact with peccia, &amp; family agency use.</td>
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<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell</td>
<td>1994</td>
<td>Prospective longitudinal 2 yrs group comparisons</td>
<td>Convenience: 105</td>
<td>100%</td>
<td>Low-upper middle</td>
<td>1% APA, 1% ANA</td>
<td>Maternal negative control at time 1 was highest for boys with behavior problems (parent &amp; new teacher ratings) that continued for 2 yrs after pre-school, followed by boys whose behavior problems did not continue, followed by controls.</td>
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<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell, March, et al.</td>
<td>1991</td>
<td>Prospective longitudinal 1 yr</td>
<td>Convenience: 108</td>
<td>100%</td>
<td>Middle</td>
<td>1% APA, 1% ANA</td>
<td>Negative maternal control predicted higher ratings of externalizing 1 yr later for boys referred by parents or recruited from clinics, &amp; children’s offices, preschools</td>
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<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>Key Statistics</th>
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<tbody>
<tr>
<td>Campbell, Pierce, et al.</td>
<td>1996</td>
<td>Prospective longitudinal 5–6 yrs</td>
<td>Convenience: 104</td>
<td>100%</td>
<td>Hollingshead</td>
<td>1% APA, 1% ANA</td>
<td>Observed negative maternal control at age 4 predicted externalizing at age 9. Extirminating at age 4 did not predict maternal control at age 9. Negative maternal control &amp; externalizing showed positive concurrent relationships as well.</td>
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#### Key Statistics

- **Age 6 Externalizing, Father Report**
  - $r = 0.42$, $p < .01$ paternal coercion, boys & girls
  - $r = 0.42$, $p < .03$ maternal coercion, girls

- **Age 6 Manipulative Behavior With Peers, Child Report**
  - $r = 0.57$, $p < .03$ maternal negative control, boys & girls
  - $r = 0.47$, $p < .03$ maternal guidance, girls (zero-order correlations)
<table>
<thead>
<tr>
<th>Study</th>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Description</th>
<th>Site</th>
<th>cite</th>
<th>Gender</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
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<tbody>
<tr>
<td></td>
<td>Schwartz, Dodge, et al.</td>
<td>1997</td>
<td>Prospective longitudinal</td>
<td>Convenience sample: parents recruited during pre-registration for kindergarten in Nashville, Knoxville, TN, &amp; Bloomington, IN</td>
<td>5 yrs</td>
<td>schwartz</td>
<td>520</td>
<td>100%</td>
<td>Low-middle</td>
<td>Parental control (r = .15, p &lt; .001 (84% F1, 14% F2)</td>
<td>*F(1, 45) = 38.25, p &lt; .001 (84% F1, 14% F2)</td>
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<td>Parental control (F1), F2 (r = .21, p &lt; .01)</td>
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<td>Parental control (F1), F2 (r = .31, p &lt; .01)</td>
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<td>Parental control (F1), F2 (r = .35, p &lt; .01)</td>
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<td>Parental control (F1), F2 (r = .41, p &lt; .01)</td>
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<td>Child temperament F1, F2 (r = .34, p &lt; .01)</td>
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<td>Child temperament F1, F2 (r = .35, p &lt; .01)</td>
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<td></td>
<td>Child temperament F1, F2 (r = .45, p &lt; .01)</td>
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<td></td>
<td>Mother perception F1, F2 (r = .30, p &lt; .01)</td>
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<td></td>
<td>Mother perception F1, F2 (r = .35, p &lt; .01)</td>
</tr>
</tbody>
</table>

### Ages 7-13

<table>
<thead>
<tr>
<th>Study</th>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Description</th>
<th>Site</th>
<th>Population Size</th>
<th>Gender</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cohen &amp; Brock</td>
<td>1995</td>
<td>Prospective longitudinal</td>
<td>10 yrs</td>
<td>T1: 1-10 yrs; T2: 11-20 yrs</td>
<td>50%</td>
<td>Low-upper</td>
<td>5%</td>
<td>AFA</td>
<td>99% Cau</td>
<td>Power-assertive parental punishment in early childhood predicted conduct disorder at ages 10-18 &amp; 12-20 after controlling for early behavior problems, parent psychopathology, marital conflict, age &amp; SES.</td>
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<td>830</td>
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</tr>
</tbody>
</table>

Younger Children (1-5 yrs at T1)

- **r = .19** behavior problem T1—punish T2
- **r = .10** punish T1—behavior problem T2
- **r = .13** punish T2—behavior problem T3
- **r = .25** behavior problem T3—punish T1
- **r = .29** behavior problem T2—punish T2

Older Children (6-10 yrs at time 1)

- **r = .42** behavior problem T1—punish T1
- **r = .27** behavior problem T2—punish T2

(All correlations are significant at the .05 level)
Family Characteristics—Discipline and Conflict
Ages 7–13

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Size</th>
<th>Ages</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeney, McGee, et al.</td>
<td>1998</td>
<td>Prospective</td>
<td>conservative births, spring 1972–1973, Dunedin, New Zealand</td>
<td>649</td>
<td>7–9 yrs &gt; 15 yrs</td>
<td>93%</td>
<td>N/R</td>
<td>2% K/M Polyn</td>
<td>Parents' reports of early behavior problems were associated with inconsistent discipline, male gender, &amp; poor maternal mental health, taking into account family adversity &amp; parental strictness. Externalizing in adolescence was predicted by inconsistent &amp; relaxed (tax or neutral) discipline, accounting for gender &amp; early behavior problems.</td>
</tr>
<tr>
<td>Patterson, Forghols, et al.</td>
<td>1998</td>
<td>Prospective</td>
<td>recruited from 4th-grade boys in 11 randomly selected schools in neighborhood with high delinquency rates, metro area of mid-size NW city</td>
<td>206</td>
<td>9–10 yrs &gt; 18 yrs</td>
<td>100% Low-middle</td>
<td>75%</td>
<td>N/R, Cau</td>
<td>“majority”</td>
</tr>
<tr>
<td>Shumway, Vandell, &amp; Powner</td>
<td>1998</td>
<td>Prospective</td>
<td>convenience sample with children in 9 urban public schools with highest % of subsidized school lunch, Milwaukee, Wl; children in after-school programs &amp; matched (gender) random sample with mother after school</td>
<td>184</td>
<td>3rd &gt; 5th gr</td>
<td>47% Low</td>
<td>$15,361</td>
<td>48% Afr</td>
<td>Parenting variables did not predict child behavior problems over time. Harsh parenting was concurrently associated with 3rd &amp; 5th-grade behavior problems (parent report), &amp; misconduct in 5th gr (child report) &amp; lower adjustment in 5th gr (teacher report), accounting for family income &amp; structure, parental education, race, &amp; marital unemployment. Firm-responsive parenting was associated with more child responsibility in 3rd grade &amp; less 5th-grade misconduct &amp; behavior problems. Permissive parenting was not associated with adjustment in 3rd or 5th yr.</td>
</tr>
</tbody>
</table>

Key Statistics
Early Problem Behavior, Age 7–9 Predictors
Adj OR = 3.0, p < .001 inconsistent discipline
Adj OR = 1.5, p < .05 male
Adj OR = 4.5, p < .001 poor maternal health
(controls: family adversity & strictness)
Externalizing, Age 15 Predictors
Adj OR = 2.3, p < .05 early behavior problems
Adj OR = 2.1, p < .05 relaxed & inconsistent discipline
(controls for gender)
(multivariate logistic regression analyses)
<table>
<thead>
<tr>
<th>Family Characteristics—Discipline and Conflict</th>
<th>Ages 7–13</th>
<th>Ages 14–19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authors</strong></td>
<td>Wisserman, Miller et al.</td>
<td>Age Design</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>1986</td>
<td>Prospective</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>1997</td>
<td>Prospective</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>1999</td>
<td>Retrospective</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>1999</td>
<td>Retrospective</td>
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<tr>
<td><strong>Year</strong></td>
<td>1999</td>
<td>Longitudinal</td>
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<tr>
<td><strong>Year</strong></td>
<td>1999</td>
<td>Retrospective</td>
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<tr>
<td><strong>Key Statistics</strong></td>
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<td><strong>Key Statistics</strong></td>
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</table>
Family Characteristics—Discipline and Conflict
Ethnic Minority Populations

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deckard et al.</td>
<td>1996</td>
<td>3 yrs</td>
<td>566</td>
<td>3 yrs</td>
<td>39%</td>
<td>82% White</td>
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</table>

Result: National reports of physical discipline, low SES, male gender, single-mother mental status, & race by physical discipline interaction.

- Predicted school externalizing (teacher ratings of externalizing, peer-rated aggression, & peer-rated teacher-child conflict, averaged over 3 yrs). Higher levels of physical discipline predicted school externalizing for European American but not African American children. Mother-rated externalizing was predicted by high levels of physical discipline, male gender, low SES, & race. African American mothers reported less externalizing, more physical discipline, lower SES, & more single-parent status than European American mothers.

Key Statistics

School Externatization, Teacher & Peer Ratings

Step 1: $\Delta R^2 = .27, p < .001$

- $b = 0.22$, race
  - $p = .42$, gender
  - $-20$ SES $p < .001$
  - $p = .17$, marital status

Step 2: $\Delta R^2 = .29, p < .001$

- $b = .15$, $p < .001$, discipline

Step 3: $\Delta R^2 = .30, p < .001$

- $b = .42$, race, $p < .001$
  - $r = .07$, race
  - $r = .31$, $p < .001$, Euro American

Externalizing, Maternal Ratings

Step 1: $\Delta R^2 = .07, p < .001$, (marital status $p = ns$)

- $b = -.13, p < .05$, race
  - $p = .09, p < .05$, gender, $-26, p < .001$ SES

Step 2: $\Delta R^2 = .18, p < .001$

- $b = .35, p < .001$, discipline

Step 3: $\Delta R^2 = .18, p < .001$

- $b = .22, p < .05$, race, discipline

(Hierarchical multiple regressions, 3 steps, $N's$ N/R)

- $r = .22$, race & physical discipline
- $r = -.40$, race & SES, -.21 race & marital status

(p's < .001, correlations)

Control & Conduct Disorder

- $r = .26$, Anglo, race, M/F, $p < .05$

Hostile Control & Conduct Disorder

- $r = .39$, Anglo, $25$ Meer Am M/M
  - $r = .32$, Anglo, $25$ Meer Am M/Ch
  - $r = .34$, Anglo, Meer Am C/Ch

Inconsistent Discipline & Conduct Disorder

- $r = .28$, Anglo, Meer Am M/M

Anglo children, marital status, & discipline than Anglo mothers, & Hispanic children reported higher levels of maternal control & hostile control than Anglo children. Mothers who were more acculturated reported less inconsistent discipline & hostile control, & their children reported less hostile control.

(p = .05, c2, $r = .37, p < .05$, mother acculturation)

(Lack of significant control & conduct results)

(see study for gender, control results)

(there is gender in ANOVA)
### Family Characteristics—Discipline and Conflict

**Ethnic Minority Populations**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Representation &amp; Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Experience &amp; Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambohn &amp; Steinberg</td>
<td>1996 Prospective longitudinal 3 yr</td>
<td>Convenience: recruited from 6 CA high schools</td>
<td>3,597</td>
<td>90-110th</td>
<td>51% Low-middle</td>
<td>18.5% AA</td>
<td>60% Cauc</td>
<td>15.5% Hisp</td>
</tr>
</tbody>
</table>

### Treatment & Preventive Interventions

| Bank, et al. | 1991 Intervention Random Assignment 3-yr followup | Source specific | Repeat offenders, 16 yrs & younger, referred by Juvenile Court, OR county; resided near the center | 55 | All = 14 yrs | 12 yrs old | N/N | Adolescents in the parent training (monitoring & discipline) treatment group spent less time in institutions during the 2-yr followup than youth who took part in traditional tx (family therapy, monitoring of school attendance/performances, group drug counseling). Rate of referrals offending declined for both tx groups but youth in the parent training group showed reductions during the 1st year, while controls showed reductions during the 2nd year. The prevalence rate of substance offenses declined for both groups; however, youth in the parent training group had fewer substance offenses at 3 followup. |

### Key Statistics

Unilateral Adolescent Decision Making—Deviant Beh

\[ \delta = 0.9, \rho = 0.6, \beta = 0.23 (n = 62) \text{ AA-Am} \]

\[ \delta = -1.7, \rho = 0.6, \beta = 0.46 (n = 188) \text{ AA-Am} \]

\[ \delta = 0.07, \rho = 0.001, \beta = 0.25 (n = 2,246) \text{ Eur-Am} \]

\[ \delta = -0.8, \rho = 0.05, \beta = -0.22 (n = 662) \text{ AA-Am} \]

\[ \delta = -0.6, \rho = 0.01, \beta = -0.19 (n = 2,246) \text{ Eur-Am} \]

\[ \delta = -0.8, \rho = 0.05, \beta = -0.25 (n = 537) \text{ Hisp-Am} \]

(Judgment and decision making control for 1987 decision making)

Ethnic Group by Diagnostic Category

<table>
<thead>
<tr>
<th>White</th>
<th>Black</th>
<th>Asian</th>
<th>Native American</th>
</tr>
</thead>
<tbody>
<tr>
<td>54%</td>
<td>35%</td>
<td>13%</td>
<td>6%</td>
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</tbody>
</table>

(M's with different letters differ, p < 0.05)

(MANCIDVIA, univariate tests, Bonferroni correction)

### Institution Time, Tx, Followup 1, Followup 2

\[ U = 268.5, \rho < 0.04, M's = 28.3, P < 0.04 \text{ IT-45 CC} \]

\[ U = 264.5, \rho < 0.03, M's = 23.9, P < 0.03 \text{ IT-45 CC} \]

\[ U = 250.5, \rho < 0.07, M's = 34.4, P = 0.07 \text{ IT-77 CC} \]

Nonstatus Offense Rates Wilcoxon's z = .72

Baseline - Tx: \( F(1,53) = 0.3, p > 0.01 \text{ M's} = 3.6, 1.11 \text{ PT, 3.9, 2.55 CC} \)

Tx: Followup 1: \( F(1,53) = 2.12, p = 0.15 \text{ M's} = 1.1, 1.4 \text{ PT, 2.5, 1.0 CC} \)

\( p = \text{ ns (followup 1 vs 2) } \text{ and 3 for 3 followups) } \)

Nonstatus Prevalence Rates Wilcoxon's z = .72

Followup 3: \( F(1,53) = 4.25, p < 0.05 \text{ M's} = 10, 17 \text{ CC} \)

Overall Offense Rate, \( p = \text{ ns (group, p < 0.01) year } \text{ and 3 followups) } \)

Status Offense Rate, \( p = \text{ ns (group, p < 0.05, year } \text{ and 3 followups) } \)

\( *\text{ ns (followup 2 vs 3) } \)
Family Characteristics—Discipline and Conflict Treatment & Preventative Interventions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Study Assignment</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearman,</td>
<td>1995 Intervention</td>
<td>Random assignment</td>
<td>Youth &amp; families referred by juvenile services</td>
<td>126</td>
<td>12-17 yrs</td>
<td>68%</td>
<td>Low-middle</td>
<td>20% APA</td>
<td>Adolescents &amp; their families who completed multisystemic therapy (MST) demonstrated greater improvements in family relationships &amp; parent-reported adolescent behavior than those who completed individual therapy (IT). Observations of mother-adolescent, father-adolescent, &amp; mother-father dyads found increased supportiveness &amp; reduced conflict-hostility for MST families. At 4-yr followup, MST completers had a lower risk of arrest than IT completers. In addition, MST completers who were arrested or had fewer overall arrests, &amp; fewer arrests for violent crimes, &amp; they were arrested for less serious crimes, compared to IT completers &amp; residents.</td>
</tr>
<tr>
<td>et al.</td>
<td></td>
<td></td>
<td>Missouri delinquency project</td>
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</tbody>
</table>

Key Statistics

Supportive vs. Pre-Post Intervention

\[ F(1, 123) = 6.47, p < .01 \text{ or } F(1, 123) = 6.47, p < .01 \]

Conflict & Hostility, Pre-Post Intervention

\[ F(1, 123) = 5.30, p < .05 \text{ or } F(1, 123) = 5.30, p < .05 \]

Behavior Problems: Mother Report, Pre-Post Intervention

\[ F(1, 123) = 4.97, p < .05 \]

Rerun Values (control for pre-treatment variance)

\[ r(1, 123) = .866, p < .003 \]

Rerun Values (control for pre-treatment variance)

\[ r(1, 123) = .866, p < .003 \]

Boys who participated in multidimensional treatment foster care (MTFC) showed a greater reduction in rates of official criminal referrals & reported less delinquency, fewer offenses, & felony assaults in the year following treatment than boys who received group care (GC). Participation in MTFC predicted official referrals & self-reports of delinquency, fewer offenses, & felony assaults, even after accounting for pre-treatment offense rates, age at first offense, & age at baseline.

Rerun Values (control for pre-treatment variance)

\[ r(1, 123) = .866, p < .003 \]

Rerun Values (control for pre-treatment variance)

\[ r(1, 123) = .866, p < .003 \]

Source specific: Child & youth offenders referred by juvenile justice system for community placement, inner-city areas of mid-size Pacific NW cities

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Design</th>
<th>Assignment</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamberlin &amp; Reid</td>
<td>1998</td>
<td>Intervention</td>
<td>Random assignment</td>
<td>79 yrs</td>
<td>12-17 yrs</td>
<td>100%</td>
<td>N/R</td>
<td>6% APA</td>
<td>Boys who participated in multidimensional treatment foster care (MTFC) showed a greater reduction in rates of official criminal referrals &amp; reported less delinquency, fewer offenses, &amp; felony assaults in the year following treatment than boys who received group care (GC). Participation in MTFC predicted official referrals &amp; self-reports of delinquency, fewer offenses, &amp; felony assaults, even after accounting for pre-treatment offense rates, age at first offense, &amp; age at baseline.</td>
<td>65% Caucaus</td>
</tr>
</tbody>
</table>

Rate of Official Criminal Referrals

\[ F(1, 77) = 3.91, p < .05 \text{ or } F(1, 77) = 3.91, p < .05 \]

Deception, Self-Report, 1-Year Followup

\[ F(1, 77) = 6.50, p = .01 \]

Index Offenses, Self-Report, 1-Year Followup

\[ F(1, 77) = 5.30, p < .05 \text{ or } F(1, 77) = 5.30, p < .05 \]

Felony Assaults, Self-Report, 1-Year Followup

\[ F(1, 77) = 4.10, p = .05 \text{ or } F(1, 77) = 4.10, p = .05 \]

ANCOVA (stepwise hierarchical multiple regression)
### Family Characteristics—Discipline and Conflict Treatment & Preventative Interventions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tremblay, McCord, &amp; al.</td>
<td>1991</td>
<td>Intervention random assignment</td>
<td>Population: boys in 52 public schools, low-SES areas, Montreal, Canada were rated by kindergarten teachers; disruptive boys (&lt;70%) with Canadian-born, French-speaking parents, &lt;15 yrs of school, were eligible</td>
<td>172</td>
<td>6 &gt; 12 yrs</td>
<td>100%</td>
<td>Low</td>
<td>100% Cauc (French Canadian)</td>
<td>Boys who participated in a 2-yr preventative treatment program of parent training (monitoring, effective discipline, &amp; positive reinforcement)</td>
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<td>Low</td>
<td>&lt;15 yrs parents ed</td>
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<td>&lt;15 yrs parents ed</td>
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<td>&lt;15 yrs parents ed</td>
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<td></td>
<td></td>
<td>Low</td>
<td>&lt;15 yrs parents ed</td>
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</tbody>
</table>

### Additional Information

- **Misbehavior, % Children Reporting 1 (+) Incident**
  - Fighting outside home:
    - z(1) = 5.81, p < .001, 40% tx, 55% ctrl, 46% obv
  - Fighting in the home:
    - z(1) = 4.98, p < .001, 28% tx, 48% ctrl, 49% obv
  - Theft in the home:
    - z(1) = 5.50, p < .001, 7% tx, 24% ctrl, 23% obv

- **Mother Ratings**
  - Child disruptive behavior:
    - F = 5.32, p < .01 post-tx
    - M's = 13.3 tx, 10.5 ctrl, 11.0 obv
    - (p's = ns; followup yrs 1 & 2)
  - Fighting:
    - F = 6.50, p < .001 post-tx
    - M's = 2.8 tx, 1.8 ctrl, 1.9 obv
    - F = 5.61, p < .01 followup 1
    - M's = 2.3 tx, 1.7 ctrl, 2.0 obv
    - F = 3.39, p < .07 followup 2
    - M's = 1.8 tx, 1.3 ctrl, 1.8 obv
  - Teacher Ratings:
    - p's = ns, F's & M's not reported (chi-square, ANOVA)

### Additional Interventions

- **Maternal Indiscriminate Reactions, Home**
  - F (3, 81) = 5.55, p < .01 group vs tx phase
  - F (1, 27) = 5.24, p < .05 group followup 1
  - F (1, 27) = 9.48, p < .01 group followup 2
  - (Apnx M's = 15.0, 14.5, 13.5 f02 parent)
  - (Apnx M's = 15.0, 14.5, 13.5 f02 syn-par)

- **Child Aversion Behavior, Home**
  - F (3, 81) = 5.50, p < .01 group vs tx phase
  - F (1, 27) = 8.00, p < .01 group followup 2
  - (Apnx M's = 10.0, 11.0 f02 parent training
  - Apnx M's = 10.0, 11.0 f02 syn-par
  - (Apnx = approximate M's from figure)
  - (Note: synthesis teaching was conducted during baseline; no group differences were found at baseline) (ANOVA)
### Family Characteristics—Discipline and Conflict

**Treatment & Preventative Interventions**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Year Design</th>
<th>Treatment Intervention</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td>Weistler-Stratton</td>
<td>1998</td>
<td>Intervention random assignment</td>
<td>1-yr followup</td>
<td>296</td>
<td>4-6 yrs</td>
<td>53% Low</td>
<td>14% ARA</td>
<td>4% Asian</td>
<td>Families who took part in a parent training intervention showed greater improvements in maternal parenting &amp; child behavior than families in Head Start alone. Mothers in the parent training intervention used less harsh &amp; inappropriate discipline &amp; more appropriate limit setting, &amp; were observed to use more competent discipline than mothers in the Head Start-only group. Children in the intervention group showed a greater reduction of observed problem behaviors, negativity, &amp; noncompliance than did children in the control group. Treatment effects were maintained after 1 yr. Mother &amp; teacher reports of child behavior problems did not show treatment effects.</td>
</tr>
</tbody>
</table>

### Key Statistics

- **Harsh Maternal Discipline, Self-Report**
  - Pre-Post: $t = -4.41, p < .001$ $t(28) = 1.18$ post IV
  - Pre-followup $t = -6.94, p < .001$ $t(25) = 1.16$ post IV
  - Inconsistent Maternal Discipline, Self-Report
    - Pre-Post: $t = -2.52, p < .01$ $t(28) = 1.14$ post IV
    - Pre-followup $t = -3.01, p < .01$ $t(25) = 1.19$ post IV
  - Discipline Competence, Observed
    - Pre-Post: $t = 3.33, p < .01$ $t(28) = 1.14$ post IV
    - Pre-followup $t = 4.32, p < .01$ $t(25) = 1.19$ post IV

### Problem Solving, Ages 0–3

| Source Specific | 44 | 2 > 6 yrs | N/R | Middle | 1% ARA | M = 16 yrs | 88% Cauc | maternal ed | 1% Eurasian | Mothers' child rearing practices & child behavior at age 2 predicted ratings of externalizing at age 3 for depressed mothers. Maternal guidance at age 2 (anticipatory, respectful guidance reflecting perspective-taking & moderated control) attenuated the relationship between maternal depression & externalizing. Child dysregulated aggression was associated with greater externalizing for children of depressed mothers. Child reports of externalizing at age 4 were lower for depressed mothers who exhibited high maternal guidance, (age 2), and higher for children who exhibited dysregulated aggression at age 2. |

### Child Rearing Practice, Age 3—Externalizing, Age 5

1. maternal diagnosis $R^2 = .26$
   - $p = .49, \Delta \beta (1, 38) = 13.3, p < .001$
2. sex of child $R^2 = .43$
   - $p = .27, \Delta \beta (2, 27) = 13.1, p < .001$
3. peer peer aggression $R^2 = .49$
   - $p = .07, \Delta \beta (3, 30) = 13.2, p < .001$
4. anticipatory, respectful guidance $R^2 = .58$
   - $p = .04, \Delta \beta (6, 33) = 13.1, p < .001$
5. dyreg aggr + maternal diagnosis $R^2 = .65$
   - $p = .04, \Delta \beta (7, 32) = 13.2, p < .001$
6. guidance x maternal diagnosis $R^2 = .71$
   - $p = .03, \Delta \beta (8, 31) = 13.2, p < .001$
7. (p<α = 0.05, dyreg aggr-child, 5, sensitivity-non) Child Rearing Practice, Age 2—Externalizing, Age 5
   - dysregulated aggression, $R^2 = .26$
   - $p = .04, \Delta \beta (9, 30) = 13.2, p < .001$
8. guidance x maternal diagnosis, $R^2 = .44$
   - $p = .04, \Delta \beta (8, 31) = 13.2, p < .001$

### (stepwise multiple regression)
### Family Characteristics–Problem Solving

#### Ages 4-6

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Ages</th>
<th>Gender</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heaven, Gottman, &amp; Katz</td>
<td>1995 Prospective longitudinal</td>
<td>Recruited nonclinical sample from Champaign-Urbana, IL; community through newspaper ad; screened for range of marital satisfaction</td>
<td>56</td>
<td>0-5 yrs &gt; 0 yrs</td>
<td>50% Male</td>
<td>Low middle</td>
<td>N/R</td>
<td>Mother's coaching of child's anger at age 5 predicted lower mother-rated oppositional behaviors (age 5), fewer behavior problems (age 8), &amp; lower teacher ratings of internalizing (age 9). Coaching of child's anger by either parent was associated with less negative play with peers (age 5).</td>
</tr>
</tbody>
</table>

#### Ages 7-13

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Ages</th>
<th>Gender</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caughlin &amp; Vuchinich</td>
<td>1996 Prospective longitudinal</td>
<td>Recruited from schools in neighborhoods with high delinquency rate, metro area of midsize OR city</td>
<td>194</td>
<td>10-17 yrs</td>
<td>100% Male</td>
<td>Low M = $16K</td>
<td>98.5% Caucasian &amp; 1.5% Mixed</td>
<td>Better family problem solving at age 10 predicted fewer arrests by age 17 for boys from stepfamilies, taking into account success in peer relations &amp; child's antisocial traits (children, parent, &amp; teacher reports of antisocial acts). Better family problem solving was associated with more arrests in single-mother families.</td>
</tr>
<tr>
<td>Vuchinich, Wood, &amp; Vuchinich</td>
<td>1994 Concurrent group comparison longitudinal</td>
<td>Convenience: (1) referred, (2) 4th gr, no risk or problems; (3) at-risk 4th-gr boys, high-delinquency areas midsize NW city</td>
<td>188</td>
<td>8-13 yrs</td>
<td>69% Low-middle</td>
<td>N/R</td>
<td>Better family problem solving was related to lower levels of externalizing. Children referred for behavioral problems had the lowest levels of family problem solving, followed by children in the at-risk group, followed by the comparison group.</td>
<td></td>
</tr>
</tbody>
</table>

#### Treatment & Preventative Interventions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Ages</th>
<th>Gender</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serger, Home, et al.</td>
<td>1988 Intervention random assignment followup</td>
<td>Recruited from referrals to be by school personnel; most aggressive students in classroom, midsize Midwestern city</td>
<td>27</td>
<td>2nd-6th gr</td>
<td>100%</td>
<td>N/R</td>
<td>N/R</td>
<td>Children &amp; families in the intervention group showed improved problem solving abilities (more positive &amp; fewer negative solutions) compared to controls. Reductions in parent reports of aggression &amp; externalizing, &amp; teacher reports of deviant classroom behavior were greater for children in the intervention group compared to controls. These changes were maintained at 9-12-month followup.</td>
</tr>
</tbody>
</table>

#### Key Statistics

- Mother Coaching, Age 5
  - $r = -0.27, p < .10$ mother CBCI, age 8
  - $r = -0.36, p < .05$ teacher interpersonal, 8
  - $r = -0.32, p < .05$ opposition, age 9
  - $r = -0.22, p < .05$ negative play, age 5
- Father Coaching, Age 5
  - $r = -0.30, p < .05$ negative play, age 5

- Stepfamilies (n = 59) 75% correct prediction
  - OR = 0.47, $p < .05$ family problem solving
  - OR = 0.23, $p > .05$ peer relations
  - OR = 0.29, $p = ns$ antisocial trait
- Single-mother Families (n = 55) 73% correct
  - OR = 0.47, $p < .05$ family problem solving
  - OR = 0.25, $p < .05$ peer relations
  - OR = 0.29, $p < .10$ antisocial trait

- Family Problem Solving–Externalizing
  - $r = -0.31, p < .05$

- Family Problem Solving
  - F(2, 185) = 22.0, $p < .05$
  - M = 11.9 referred, 13.9 at risk, 16.4 comparison
  - (all M's different, $p < .05$)

- ANOVA, Scheffe test

- Externalizing, Parent Report
  - $p < .001$, M's = 10.96, 7.64, 7.64
- Aggressive Behavior, Parent Report
  - $p < .001$, M's = -1.75, -0.12, -0.12
- Solutions, Obese $p < .02$, M's = 12.2, 5.22
- Solutions, Obese $p < .001$, M's = -14.4, 9.67
- ANOVAs on gain scores, F's not reported
- Reduction, Deviant Classroom Behavior, Teacher Report
  - 49% $p < .05$, 18% $p = .70$
  - Followup, 9-12 months (n = 20)

- Externalizing, F = 7.48, $p < .001$
  - M's = 73.3 yrs, 62.3 yrs
- Aggressive behavior F = 7.35, $p < .001$
  - M's = 17.9 yrs, 6.3 yrs
- Positive solutions F = 9.07, $p < .001$
  - M's = 84 yrs, 75 yrs
- Negative solutions F = 7.65, $p < .001$
  - M's = 26 yrs, 14 yrs

- (repeated measures ANOVA)
Family Characteristics—Structuring of the Learning Environment
Ages 7–13

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representative Sample</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jenkins</td>
<td>1997</td>
<td>Concurrent</td>
<td>Recruited from middle school in D1, students from urban &amp; suburban areas; 93% participation</td>
<td>754</td>
<td>11–15 yrs</td>
<td>50%</td>
<td>Low-middle</td>
<td>29% qualify free/reduced-price lunch</td>
<td>22% AfrA</td>
</tr>
</tbody>
</table>

Ksetz, Ryan, & Adams

<table>
<thead>
<tr>
<th>Year</th>
<th>Design</th>
<th>Convenience</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
<th>School Crime</th>
<th>School Misconduct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>Concurrent</td>
<td>Recruited from Catholic elementary schools in southern Ontario, Canada, 52–53% response</td>
<td>312</td>
<td>4th &amp; 7th gr</td>
<td>46%</td>
<td>Middle</td>
<td>20%</td>
<td>12 yrs</td>
<td>60% &gt; 12 yrs</td>
<td>parent ed</td>
<td>For 4th graders, perceived maternal pressure to achieve academically had positive direct effects on teacher-reported externalizing. Parental pressure to achieve had indirect positive effects on externalizing, through lower frustration tolerance &amp; intellectual effectiveness, &amp; indirect negative effects, through lower assertiveness. Paternal support had positive direct &amp; indirect effects (through lower frustration tolerance &amp; intellectual effectiveness), while no effect was found for maternal support. For 7th graders, maternal &amp; paternal pressure to achieve had indirect positive effects (through higher frustration tolerance) on externalizing.</td>
</tr>
</tbody>
</table>

Mother, Grade 4

$t^2 (12) = 18.80, p = .09; \text{AGFI} = .92; R^2 = .65$

$r = .15 \text{pressure to achieve-externalizing}$

$r = -.20, -.83 \text{pressure-fruit, trust-est}$

$r = -.33, -.22 \text{pressure-int eff, int eff-est}$

$r = -.20, -.54 \text{pressure-assert, assert-est}$

$r = -.19, -.83 \text{support-fruit, trust-est}$

$r = -.12, -.22 \text{support-int eff, int eff-est}$

Father, Grade 4

$t^2 (8) = 11.90, p = .16; \text{AGFI} = .98; R^2 = .65$

$r = -.14, -.79 \text{pressure-fruit, trust-est}$

$r = -.28, -.24 \text{pressure-int eff, int eff-est}$

$r = -.13, -.58 \text{support-assert, assert-est}$

$r = -.16, -.103 \text{support-fruit, trust-est}$

Mother, Grade 7

$t^2 (12) = 18.88, p = .09; \text{AGFI} = .92; R^2 = .45$

$r = -.14, -.79 \text{pressure-fruit, trust-est}$

$r = -.28, -.24 \text{pressure-int eff, int eff-est}$

$r = -.13, -.58 \text{support-assert, assert-est}$

$r = -.16, -.103 \text{support-fruit, trust-est}$

Father, Grade 7

$t^2 (8) = 11.90, p = .16; \text{AGFI} = .98; R^2 = .45$

$r = -.17, -.79 \text{pressure-fruit, trust-est}$

$r = -.30, -.24 \text{pressure-int eff, int eff-est}$

$r = -.15, -.57 \text{support-assert, assert-est}$

$r = -.14, -.103 \text{support-fruit, trust-est}$

Pressure = pressure to achieve, fruit = frustration tolerance, int eff = intellectual effectiveness, assert = assertiveness, support = parental support (p < .05)

(Structural equation models)
### Family Characteristics—Structuring of the Learning Environment
**Ages 14–19**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td>Fletcher, et al.</td>
<td>1995</td>
<td>longitudinal</td>
<td>Recruits: 3/5</td>
<td>415</td>
<td>9th-11th gr</td>
<td>43%</td>
<td>Middle</td>
<td>2% ARA</td>
<td>Adolescent-reported parental monitoring was associated with</td>
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<td>samples</td>
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<td>lower exposure to delinquent peers over time &amp; unrelated to adolescent-</td>
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<td></td>
<td>Recruited students</td>
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<td>reported delinquency. Gender, age, family type, living standard,</td>
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<td>from high schools</td>
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<td>&amp; parent education were included in the model.</td>
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<td>in CA (6): urban,</td>
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<td>15% of students</td>
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<td>survey: 3% refused;</td>
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<td>over 50% of 11,000</td>
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<td>Key Statistics</td>
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<td>R² = .12 boys, .15</td>
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<td></td>
<td>girls, p = &lt;.01</td>
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<td>Home Authoritarianness:</td>
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<td>R² = .17 boys, .20</td>
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<td>girls, p = &lt;.001</td>
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<tr>
<td>Modeling Antisocial/Norm-Maintaining Behaviors, Ages 0–3</td>
<td>Journal: 1991</td>
<td>Correlational</td>
<td>Convenience: 1.400</td>
<td>200</td>
<td>36–42 yrs</td>
<td>100% Lower</td>
<td>M = 39 mths</td>
<td>N/R</td>
<td>Child-raising disagreements were associated with boys' behavior problems at age 3, after accounting for general mental disagreements or exposure to marital conflict.</td>
</tr>
<tr>
<td>Murphy, et al.</td>
<td></td>
<td></td>
<td>Study 1: recruited</td>
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<td></td>
<td></td>
<td></td>
<td>mothers in intact</td>
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<td></td>
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<td></td>
<td>families from preschools, public libraries, city council announcements; suburban Suffolk County, NY</td>
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</tr>
<tr>
<td>Modeling Antisocial/Norm-Maintaining Behaviors, Ages 0–3</td>
<td>Journal: 1991</td>
<td>Correlational</td>
<td>Convenience: 1.400</td>
<td>87</td>
<td>46-75 yrs</td>
<td>100% Lower</td>
<td>M = 61 mths</td>
<td>N/R</td>
<td>Lower general marital adjustment, more exposure to conflict, &amp; more child-raising disagreements were associated with more behavior problems for age 5 boys. Child-raising disagreements did not exert effects independent of general marital adjustment or exposure to conflict.</td>
</tr>
<tr>
<td>Murphy, et al.</td>
<td></td>
<td></td>
<td>Study 2: recruited</td>
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<td>intact families from nursery schools &amp; through newspaper ads; suburban Harris County, TX</td>
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</table>
### Ages 4–6

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>N</th>
<th>Age</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schwartz et al.</td>
<td>1997</td>
<td>Prospective</td>
<td>520</td>
<td>Pr-K</td>
<td>70%</td>
<td>Low-middle</td>
<td>According to mother reports, boys who were both aggressive &amp; bullied (aggressive victims). In middle childhood had more marital &amp; parental aggression at home in early childhood than passive victims. Nonvictimized aggressors &amp; controls, had more marital conflict than passive victims or controls. Nonvictimized aggressors had been exposed to more violence than control boys.</td>
</tr>
</tbody>
</table>

### Ages 7–13

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>N</th>
<th>Age</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Convictions between ages 10 and 20 were predicted by having a convicted parent, accounting for child troublesomenes from ages 8–10. Having a delinquent older sibling predicted convictions between ages 10 and 20, once parent conviction, child troublesomeness, dummy, &amp; low school attainment were taken into account.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farrington &amp; Hawkins</td>
<td>1991</td>
<td>Prospective</td>
<td>411</td>
<td>8–9</td>
<td>32 yrs</td>
<td>100% Low</td>
<td>R² = .47 (controlling for early antisocial behavior)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100% Low</td>
<td>&lt; .01</td>
<td>100% Cauc</td>
<td>Convictions Ages 10–20</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>90% Cauc</td>
<td>&lt; .01</td>
<td></td>
<td>R² = .44 (controlling for early antisocial behavior, convicted parent, high delinquency, &amp; low school attainment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100% Low</td>
<td>&lt; .01</td>
<td></td>
<td>(M's with same superscript differ, p &lt; .05) (MANOVA, ANOVAs, planned comparisons)</td>
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<tr>
<td>Gorman-Smith et al.</td>
<td>1998</td>
<td>Prospective</td>
<td>288</td>
<td>11–15</td>
<td>&lt; .05</td>
<td>N/R% Afro</td>
<td>Compared to nondelinquent adolescents, serious chronic offenders were more likely to come from families characterized by deviant behaviors &amp; attitudes (parental antisocial or criminal behavior) &amp; multiple problems (disruption-conflict &amp; low parental involvement). Chronic minor offenders were less likely to come from deviant families, &amp; escalating or late onset offenders were more likely to come from families with disruption &amp; conflict than nondelinquent adolescents.</td>
</tr>
</tbody>
</table>

### Key Statistics

- **Home Environment & Aggressors/Victim Status**
  - Wilks's Λ = .81, F (27, 794) = 2.59, p < .001
  - Parental use of aggressive strategies
    - F (1, 182) = 5.12, p = .05
    - M's = 12.2%, p = .005
    - Father's aggressive variation, p = .01
    - Mother's aggressive variation, p = .01
  - Dyadic marital aggression
    - F (3, 138) = 6.13, p = .005
    - M's = 1.72, p = .01
    - Father's aggressive variation, p = .01
    - Mother's aggressive variation, p = .01
    - Marital conflict
      - F (1, 182) = 5.14, p = .05
      - M's = 2.9%, p = .01
      - Father's aggressive variation, p = .01
      - Mother's aggressive variation, p = .01
    - Exposure to violence
      - F (1, 182) = 3.15, p = .05
      - M's = 2.3%, p = .01
      - Father's aggressive variation, p = .01
      - Mother's aggressive variation, p = .01
      - (M's with same superscript differ, p < .05) (MANOVA, ANOVAs, planned comparisons)
### Family Characteristics—Modeling Antisocial/Norm Maintaining Behaviors

**Ages 14–19**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Design</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>Male %</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danks &amp; Windle</td>
<td>1997 Prospective longitudinal</td>
<td>443</td>
<td>15.5 yrs</td>
<td>46%</td>
<td>Middie</td>
<td>0.5% AA</td>
<td>Family discord (antisocial behavior) low levels of family intimacy mediated the relationship between maternal depression symptoms &amp; delinquency for girls. For boys, delinquency was associated with low levels of family intimacy.</td>
<td></td>
</tr>
<tr>
<td>Meeks, et al.</td>
<td>1996 Concurrent correlational</td>
<td>516</td>
<td>11-18 yrs</td>
<td>N/R</td>
<td>Middle-upper middle</td>
<td>94% Caucasian</td>
<td>Sibling differences in exposure to marital conflict (average mother, father, &amp; adolescent report) were associated with differences in self-reported sibling delinquency. Siblings exposed to more marital conflict were at higher risk for delinquency.*</td>
<td></td>
</tr>
<tr>
<td>Neighbors, et al.</td>
<td>1997 Prospective longitudinal</td>
<td>243</td>
<td>13-19 yrs</td>
<td>47%</td>
<td>Middie</td>
<td>100% Caucasian</td>
<td>Boys who reported antisocial behavior in young adulthood were associated with current interpersonal conflict (mother report) &amp; quality of relationship with father (adolescent perceptions), accounting for early adolescent problem behavior, age, &amp; parent’s marital status. For girls, antisocial behavior in young adulthood was associated with perceived quality of their relationship with father.</td>
<td></td>
</tr>
<tr>
<td>Ethnic Minority Populations</td>
<td>1996 Concurrent correlational</td>
<td>90</td>
<td>9-12 yrs</td>
<td>47%</td>
<td>Low-middle</td>
<td>100% AA</td>
<td>Exposure to parental conflict (parental reports) had an indirect positive effect on maternal &amp; teacher ratings of externalizing through lower youth self-regulation, after accounting for per capita income, parental religiosity, &amp; family cohesion.</td>
<td></td>
</tr>
</tbody>
</table>

**Exposure to Parent Conflict & Externalizing**

Material model: $R^2 = 0.50, F (5, 87) = 17.21, p < .01$

- $\beta = -0.26$ interpersonal conflict—self-regulation
- $\beta = -0.27$ family cohesion—self-regulation
- $\beta = -0.23$ religiosity—externalizing

**Exposure to Parent Control & Externalizing**

Material model: $R^2 = 0.47, F (5, 87) = 15.25, p < .01$

- $\beta = -0.26$ interpersonal conflict—self-regulation
- $\beta = -0.27$ family cohesion—self-regulation
- $\beta = -0.19$ religiosity—externalizing
Peer Influences

Peers play an important role in child development. Particularly as children mature into adolescents, peers play a large role in shaping both appropriate and inappropriate behaviors. However, newer evidence indicates that as early as preschool, peers begin to exert noticeable influences on child aggressive behavior. Research on the influence of peers on externalizing behavior problems can be categorized into three domains—peer rejection of aggressive behavior, peer victimization, and peer enhancement of aggression and antisocial behavior.

At first glance, the first and third domain may appear contradictory. How can aggressive behavior be rejected and also enhanced by peers? This seeming contradiction is at the heart of peer influence on externalizing behavior problems. Aggressive behavior may be rejected by conventional peers and at the same time negatively and positively reinforced. Rejection by conventional peers encourages similarly aggressive and rejected children to find one another, form friendships, and develop ways of approving and accepting aggression. Although much is known about predictive and causal risks within each domain, the interdependence, possible sequencing, and points of vulnerability across domains of peer influence are not well established.

Peer Rejection of Aggressive Behavior

Peer rejection has been shown to be a middle-childhood predictive risk factor for adolescent conduct problems over and above its concurrent correlation with childhood aggression. Several longitudinal studies have documented that children who are both rejected by their peers and highly aggressive exhibit the poorest overall adjustment in elementary school (Bierman & Wargo, 1995; Lochman & Wayland, 1994). As early as first grade, children who come from families marked by higher amounts of conflict and coercion are more likely to engage in aggressive interactions with peers (Dishion, Duncan, Eddy, Fagot, & Petrow, 1994; Schwartz, Dodge, Pettit, & Bates, 1997). In turn, aggressive children who are rejected by their peers are at increased risk for behavior problems prior to middle school (Bierman, Smoot, & Aumiller, 1993; Bierman & Wargo, 1995). For boys, the predictive relationship between early aggression and peer rejection and later externalizing behavior problems has been documented into adolescence (Cole, Terry, Lenox, Lochman, & Hyman, 1995).

To understand why peer rejection has such negative effects for children, one must recall research described in the Child Characteristics section. Children who are both rejected and aggressive show a more pervasive pattern of behavioral and social deficits—including inattention, argumentative and disruptive behaviors, and poor prosocial behavior—unlike children who are aggressive but not rejected or rejected but not aggressive. Also, children who are both rejected and aggressive are more likely than their nonaggressive well-liked peers to develop biased social information processing involving a
tendency to attribute hostile intentions to others (Dodge, 1980; Dodge & Frame, 1982). This attributional style increases the likelihood that they will respond toward other children in a retaliatory, aggressive manner (see Child Characteristics section for more details).

Evidence exists that peer rejection associated with aggression is malleable and can function as a causal risk factor for externalizing behavior problems. By specifically targeting children who appear rejected because of their aggressive behavior, interventions that provide anger management skills and prosocial means of solving peer conflicts have resulted in increased peer acceptance and decreased child aggressive and externalizing behavior problems (Conduct Problems Prevention Research Group, 1999; Lochman, Coie, Underwood, & Terry 1993).

Victimization

In addition to the negative attributional biases exhibited by rejected and aggressive children, evidence shows that peers are more likely to attribute hostile intentions and respond more aggressively when the perpetrator is considered an aggressive youngster (Dodge, 1980; Dodge & Frame, 1982). Rejected youth are more likely to be treated negatively by their peers and are more likely to be victims of peer attack and abuse (Perry, Kusel, & Perry, 1988). Newer research has documented that the victimization experienced by socially rejected children includes not only physical attacks but also acts that undermine their relationships with other peers (i.e., relational aggression) (Crick, Casas, & Ku, 1999; Crick & Grotz, 1996). The correlation between peer rejection and relational aggression victimization has been found for children in preschool and elementary school.

Aiding to the work on early peer victimization is the consistent correlation between being a victim of crime and being a criminal offender (Esbensen & Huizinga, 1991; Sampson & Lauritsen, 1990; Singer, 1986). Adolescents who are offenders are likely to be victims, and vice versa. It is not clear whether criminal victimization predicts later offending or whether early offending predicts later victimization. Also, it is not known whether criminal victimization in adolescence is predicted by the experience of peer victimization in elementary and middle school.

Peer Enhancement

Although aggressive children are at higher risk for peer rejection, aggressive and rejected children do have friends, and their friends also tend to be aggressive (Cairns, Cairns, Necker, Gaps, & Gari, 1988; Haselager, Hertup, van Leshout, & Riksen-Waltaren, 1998; Tremblay, Mass, Vitaro, & Dobkin, 1995). As early as preschool, research has documented aggressive children to be part of social cliques that are particularly likely to be characterized by aggression (Farver, 1996). Aggressive friendships tend to be stable (Giordano, Cernkovich, & Pugh, 1986), and being a member of a group with other aggressive children and/or adolescents is a predictor of later conduct problems for both girls and boys (Kupersmid, Burchinal, & Patterson, 1995).

Selection of mutually aggressive and deviant friends can expand in adolescence to pairings with the opposite sex. Antisocial behavior is a strong selection factor in couple formation. Individuals with a history of antisocial behavior in adolescence are likely to become partners with similar individuals (Krueger, Moffitt, Caspi, Bleske, & Silva, 1998). In turn, assortive pairing for antisocial behavior is associated with continued involvement in antisocial behavior during the adult years (Yamaguchi & Kandel, 1993). In contrast,
supportive, nondeviant partners are a source of protection, breaking the continuity in antisocial behavior between adolescence and adulthood (Quinton, Pickles, Maughan, & Rutter, 1993).

Peers also serve to reinforce aggressive behavior, particularly for children who have difficulty with aggression (Snyder, Hotsch, & Childs, 1997). Young (preschool- and elementary school-aged) aggressive children are much more likely to initiate, reciprocate, and persist with aversive behavior with their peers than are nonaggressive children (Snyder & Brown, 1983). In elementary school, research on bullying (the assertion of power through aggression, repeated over time and intended to cause harm) has found the peer group to be critical in maintaining, exacerbating, and terminating bullying. Peers tend to give positive attention to bullies by watching, cheering, and sometimes joining the bully. The positive attention has been correlated with longer bouts of bullying (O'Connell, Pepler, & Craig, 1999). Also, boys who bully in early adolescence have been shown to be at higher risk for antisocial behavior in adulthood (Farrington, 1993). Although several antibullying programs have been developed for schools, these interventions have not specifically targeted peer processes in bullying.

The role of peers in enhancing delinquent and antisocial behavior in adolescence is well established. Most of the externalizing behavior problems of adolescents—including violent acts toward others—occur in deviant peer groups. For elementary- and middle school-aged boys, association with deviant peers is not only correlated concurrently with conduct problems but is also a predictive risk factor for increased involvement over time (Elliott, Hutzinger, & Menard, 1989; Keenan, Loeb, Zhang, Stouthamer-Loeb, & Van Kammen, 1995; Patterson, 1993; Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997). Deviant peers also engage in forms of deviance training in which antisocial talk (e.g., bragging about physical assaults, discussing delinquent acts) meets with approval and positive reinforcement (Dishion, Eddy, Haas, Li, & Spracklen, 1997). In highly deviant groups (i.e., juvenile street gangs), group membership is correlated with increased delinquent behavior (Bjergaard & Smith, 1993). Studies following youth before, during, and after their gang membership show that rates of delinquency, especially violent delinquency, are substantially higher when a young person is a member of a gang than either before or after membership (Esbensen & Huizinga, 1993; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993).

The most powerful evidence for documenting peer enhancement of conduct problems as a causal risk factor comes from failed interventions that involved grouping together high-risk youth. Interventions that group together high-risk youth, even in the presence of therapeutic intervention, have been shown to result in increasing delinquent behavior (Dishion & Andrews, 1995; Dishion, McCord, & Poulin, 1999). In contrast, research on therapeutic foster homes for delinquent youth that involve definitive changes in parenting and strict enforcement of no contact with deviant peers shows that these interventions result in decreased delinquency (Chamberlain & Reid, 1998).

Clearly, peer enhancement of conduct problems is a significant causal risk factor for antisocial behavior. By adolescence, the only established way to effectively reduce this influence is to remove contact with deviant peers. It is not known whether interventions aimed at reducing early peer reinforcement of aggressive behavior or bullying also may be effective in reducing conduct problems and deterring development of delinquent behavior. Nor is it known whether interventions designed to decrease peer rejection also may decrease peer enhancement of aggressive behavior. Given the strength of evidence about the role of peers in externalizing behavior problems, these questions appear ripe for investigation.
Implications for Malleable Peer Risk Factors and Developmental Processes

Research on peer influences shows that, beginning in elementary school, peers can have profound causal effects on externalizing behavior problems. Within the first years of school, one can see peer rejection of aggressive children, aggressive children beginning to form relationships with similarly aggressive children, and peers beginning to attribute greater hostile intent and aversion to aggressive classmates. At the same time, aggressive children are more likely to engage in and escalate their aggressive behavior with aggressive peers, to develop hostile attributional styles for interpreting social encounters with others, to be the victim of peer attacks, and to bully others. This vicious cycle of early peer rejection, hostile attributional processes, and increased aggressive behavior, however, is malleable. Interventions that target early aggressive behavior by providing anger management skills and prosocial means of solving peer conflicts and reducing hostile intent toward others have resulted in increased peer acceptance and decreased externalizing behavior problems.

It is critical to expand on these important results in two ways. First, the outcomes from these interventions should be expanded beyond peer rejection and hostile intent to include indices of peer victimization and formation of peer cliques. Are the skills learned through intervention generalizable to these domains of peer influence? Also, long-term effects need to be documented. If these early interventions are successful in deterring the formation of aggressive and antisocial cliques, this could have profound effects during adolescence by deterring association with deviant peers and preventing the escalation of serious antisocial behavior. Clearly, long-term followup of these interventions is needed.

The second way to expand these interventions is through research to determine ways of effectively translating the interventions for use by communities, schools, and mental health service systems. School policies, classroom structure, and classroom management also may correlate with externalizing behavior problems (see the Broader Social Environment, Communities, and Schools section), which could intensify or constrain interventions. Critical issues will need to be addressed: who will receive the intervention (all children or only targeted high-risk children), when in development the intervention will be most effective (e.g., early versus late elementary school), for whom the intervention should continue, who should administer and deliver the intervention, and what should administering and delivering the intervention cost? However, the potential gain of decreased externalizing behavior problems is well worth the effort.

Although the potential for early peer interventions to affect adolescent association with deviant peers requires further empirical testing, the current data on deviant peers are quite clear: association with deviant peers during adolescence is a significant causal risk factor for antisocial behavior. Grouping similarly deviant adolescents together, even in the presence of therapeutic interventions, serves only to maintain and possibly enhance antisocial behavior. This finding is in direct conflict with many educational, community, and state policies and services that group troubled youth together in classrooms or in group homes. Clearly, these policies deserve re-examination given these research findings. Also, there needs to be more research that examines alternatives to group placement (e.g., therapeutic foster care) and that addresses ways of preventing association with deviant peers during pre- and early adolescence (e.g., after-school programs, increased parental monitoring).

In looking over the research on peer rejection, victimization, and enhancement of aggressive
behavior, it is not clear how these three forms of peer influence interact or mutually develop over time. Although research indicates that rejected and aggressive children are more likely to be victimized in grade school, it is not clear whether these children are also at risk for victimization during adolescence. Also, how does early victimization affect peer acceptance and the formation of social cliques? Are there developmental events, child characteristics, or family influences that increase vulnerability to peer influence and, therefore, could be used to more effectively target preventive interventions? Some of the fundamental peer processes involved in the development of externalizing behavior problems have been established; research is needed that pursues more complex interactions and the developmental timing of peer influences from early childhood through adolescence.

References


Dishion, T. J., McCord, J., & Poulton, F. (1999). When interventions harm: Peer groups and


pairing and continuities in conduct disorder. *Development and Psychopathology, 5*, 765–783.


<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Size</th>
<th>Age*</th>
<th>% Male</th>
<th>SES**</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
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</thead>
<tbody>
<tr>
<td>Bieman, Smoot,</td>
<td>1993</td>
<td>Concurrent group comparisons</td>
<td>95</td>
<td>2/3, 3/4, 5/6 10%</td>
<td><em>Mixed</em></td>
<td>96% Cau</td>
<td>4% N/R</td>
<td>Elementary school boys rated by their peers as both aggressive &amp; rejected had higher teacher, peer, &amp; observer ratings of argumentative-disruptive behavior (verbal aggression, hyperactivity, rule violations, &amp; disruptiveness) than boys who were rejected only, aggressive only, or nonproblematic. All 3 problem groups had lower peer &amp; teacher ratings of prosocial behavior than nonproblematic boys.</td>
<td>Argumentative-Disruptive: $F(3, 84) = 16.45, \ p &lt; .001$  [H = .66^a \text{ aggressive-rejected} ]  [H = -.35^a \text{ aggressive} ]  [H = -.12^a \text{ rejected} ]  [H = -.58^a \text{ comparison} ] Prosocial behavior: $F(3, 84) = 44.31, \ p &lt; .001$  [H = -.65^a \text{ aggressive-rejected} ]  [H = -.45^a \text{ aggressive} ] [H = -.29^a \text{ rejected} ]  [H = 1.14^a \text{ comparison} ] (ANCOVAs with different superscripts, differ $p &lt; .05$)</td>
</tr>
<tr>
<td>Bieman &amp; Wargo</td>
<td>1995</td>
<td>Prospective longitudinal 2 yrs</td>
<td>81</td>
<td>1/2, 3/4, 5/6 &gt; 3/4</td>
<td><em>Mixed</em></td>
<td>96% Cau</td>
<td>4% N/R</td>
<td>Elementary school boys rated by peers as aggressive-rejected exhibited a maladaptive developmental trajectory over 2 yrs; they continued to be rated as more aggressive &amp; hyperactive-disruptive by peers &amp; teachers than comparison children, taking into account T1 behavioral differences, &amp; were also less preferred by peers. Rejected or aggressive children had a more normalizing trajectory; on most T2 measures they resembled comparison children, although aggressive children continued to be more disruptive.</td>
<td>Agg/Rel Group Time 1 &amp; Behavior Time 2  [Aggression: F(3, 69) = 16.36, \ p &lt; .05 ]  [Disruptive-hyperactive: F(3, 69) = 18.34, \ p &lt; .05 ] Social preference: $F(3, 69) = 7.45, \ p &lt; .05$ [($\rho$s = rs: Group X Grade, grade &amp; interactions) ] (ANCOVA, control for T1 behavior differences, &amp; post hoc tests not reported)  [No Problem at Time 2: \chi^2(9) = 24.83, \ p &lt; .01 ]  [22% aggressive-rejected ]  [58% aggressive ]  [46% rejected ]  [83% comparison ] (df-square)</td>
</tr>
<tr>
<td>Cole, Terry, et al.</td>
<td>1995</td>
<td>Prospective longitudinal 8 yrs T1: 3rd grade T2-T4: 6th, 8th, 10th</td>
<td>407</td>
<td>3rd &gt; 6th, 8th, 10th gr</td>
<td>50% Low-middle</td>
<td>100% ARA</td>
<td>Self-reported externalizing behavior increased from 6th to 10th grade for boys nominated as rejected &amp; aggressive by 3rd-grade peers, but not for aggressive, rejected, or nonproblematic boys; 6th-grade intercepts did not differ across group. For girls, 6th-grade externalizing was higher for aggressive girls, &amp; was consistent from 6th to 10th grades. Analyses of parent reports found that externalizing was higher for rejected than nonrejected boys. Aggressive boys showed an increase in externalizing from 6th to 10th grades, while nonaggressive boys showed a decrease.</td>
<td>Boys, Self-Report: $F(1, 477) = 4.12, \ p &lt; .04 ]  [\gamma's = 6.40 \text{ nonaggressive, aggressive} ]  [= 1.53 \text{ rejected-aggressive} ]  [= -1.12 \text{ all others} ] Girls, Self-Report: $F(1, 477) = 6.04, \ p &lt; .01 ]  [\gamma's = 4.95 \text{ nonaggressive, 7.37 aggressive} ] Boys, Parent Report: $F(1, 473) = 8.48, \ p &lt; .001 ]  [\gamma's = 15.4 \text{ nonrejected, 19.4 rejected} ]  [= -.09 \text{ nonaggressive, .51 aggressive} ] (growth curve analysis, mixed model ANOVA)</td>
<td></td>
</tr>
</tbody>
</table>

* = Indicates that data at first age are used to predict data at second age.  
** Unless otherwise indicated, income is reported in yearly amounts.
### Peer Influences—Peer Rejection

**Authors:** Shichl, Duncan, et al.

**Year:** 1994

**Design:** Concurrent, random assignment

<table>
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<tr>
<th>Approaches</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td>Convenience; recruited 3rd graders from 28 classrooms, inner-city school system; selected peer-rated rejected children from pool of 602 students; 4 groups: aggressive/rejected IV &amp; controls, rejected IV &amp; controls</td>
<td>3rd gr</td>
<td>34%</td>
<td>Low-middle</td>
<td>100% AFA</td>
<td>Boys rated by their peers as aggressive &amp; rejected (AR) who took part in a school-based social relations intervention had lower teacher ratings of aggression &amp; rejection, &amp; higher peer ratings of social acceptance post-intervention than children in the control group. At 1-yr followup, AR children in the intervention group continued to have lower teacher ratings of aggression than AR controls, &amp; received higher teacher ratings for prosocial behavior. Children who were rejected but not aggressive showed no intervention effects post-intervention or at followup.</td>
</tr>
</tbody>
</table>

**Key Statistics:**
- **Chile:** Observed Aggression, School $d = .32, F(3, 156) = 5.88, p < .004$
  - $M_r = 1.93, N_r = 1.93, p < .004$
- **Chile:** Behavior Change, Parent $d = .50, F(242) = 20.57, p < .0001$
  - $M_r = 1.33, N_r = 1.00, p < .0001$
- **Chile:** Behavior Change, Teacher $d = .53, F(244) = 17.50, p < .0001$
  - $M_r = 1.62, N_r = 1.37, p < .0001$
- **Social Cognition:** Problem-Solving $d = .35, F(1, 359) = 9.61, p < .002$
  - $M_r = .51, N_r = .20, t(42), p = .03$
- **Social Cognition:** Aggressive Retaliation $d = .52, F(1, 359) = 4.33, p < .05$
  - $M_r = .43, N_r = .31, N_r = .42, N_r = .35, t(42), p = .00$
- **Peer:** Positive Peer Interactions $d = .21, F(3, 359) = 6.30, p < .02$
  - $M_r = .32, N_r = .46, p < .02$
- **Peer:** Social Preference $d = .64, F(3, 359) = 6.38, p < .02$
  - $M_r = .32, N_r = .46, p < .02$

- **Cognitive Interactions & Antisocial Behavior:** $t(24), M_r = 30.8, p < .06, G^2 = .98$
  - $t(24), M_r = 30.8, p < .06, G^2 = .98$

- **Rejection:** Peer IV, Teacher Ratings $t(17) = 2.31, p < .05, t(17) = 2.31, p < .05, t(17) = 2.31, p < .05$
### Peer Influences—Peer Rejection

<table>
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<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leachman &amp; Wayland</td>
<td>1994</td>
<td>Prospective longitudinal 4 yrs</td>
<td>Convenience: subsample of boys from 8 rural, suburban, &amp; urban elementary schools in Durham, NC; boys rated by peers as avg &amp; random sample of nonagg boys were selected from pool of 624 students, randomly assigned to 3 or 6th graders of (n = 273) 6th graders</td>
<td>114</td>
<td>11 yrs</td>
<td>100%</td>
<td>Low-middle</td>
<td>26% AFR</td>
<td>Peer-rated low social status &amp; aggression in 4th-6th grade predicted higher composite externalizing scores (teacher/peer/observer ratings) 4 years later. Self-reports of crimes against persons were predicted by higher composite peer-rated aggression but not social status.</td>
<td>Estimating behavioral, Other report ( r^2 ) (60) = .53 aggression, .36 low social ( r^2 = .33 ) ( \beta = .07, p &lt; .001 ) aggression ( \beta = .135, p &lt; .05 ) social status (p = ns: race) Crimes Against Persons, Self-Report ( r (65) = .23 ) aggression ( r^2 = .028, \beta = .005, p &lt; .005 ) aggression (p = ns: race, social status) (both models, p = ns: all interactions) (stepwise multiple regressions)</td>
</tr>
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*Schwartz et al., 1997: see "Family Characteristics, Conflict-Discipline"*

#### Peer Victimization

<table>
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<tr>
<th>Authors</th>
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<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
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<tbody>
<tr>
<td>Crick</td>
<td>1999</td>
<td>Concurrent group comparisons</td>
<td>Convenience: recruited children &amp; teachers from 9 classrooms in 3 preschools, moderate-size Midwestern city</td>
<td>129</td>
<td>4.5 yrs</td>
<td>52%</td>
<td>M/A</td>
<td>44% AFR</td>
<td>Preschoolers who experienced relational (ignored, left out) or physical (hit, pushed, called names) victimization were more rejected by peers than nonvictims. Children who experienced relational victimization were also less accepted by peers than other children. Relational victimization accounted for variance in boys’ &amp; girls’ acceptance scores, but in boys’ &amp; younger children’s (3-4.6 vs. 4.7-5.6 yrs) rejection scores, controlling for physical victimization. Analyses were based on peer reports.</td>
<td>Relational Victimization, Peer Rejection ( F (1, 114) = 6.02, p &lt; .05 ) ( M's = .06 ) nonvictim, .63 victim ( M's = .08 ) nonvictim, .58 victim Physical Victimization, Peer Rejection ( F (1, 114) = 4.27, p &lt; .05 ) ( M's = .06 ) nonvictim, .41 victim Controlling Physical Victimization ( p's &lt; .05 ), M’s victim &gt; nonvictim: peer acceptance, peer rejection, boys, &amp; peer rejection, younger child (see study for Ps and means) (MANOVA, univariate &amp; by gender, grade)</td>
</tr>
<tr>
<td>Crick &amp; Grabe</td>
<td>1996</td>
<td>Concurrent group comparisons</td>
<td>Convenience: students from 4 public schools in moderate-size Midwestern town</td>
<td>474</td>
<td>3rd-6th gr</td>
<td>52%</td>
<td>Low-middle</td>
<td>38% AFR</td>
<td>Rejected children (according to peer nominations) received more relational* victimization than popular, average, neglected, or controversial children &amp; more overt** victimization than popular or controversial children. Rejected children also received fewer prosocial acts than popular children. * relational victimization: threat/harm by peers to peer relationships; left out, gossiped, or lied about ** overt victimization: threat/harm to physical well-being; hit, pushed, hair pulled</td>
<td>Treatment by Peers &amp; Status Multivariate ( F (12, 921) = 3.0, p &lt; .001 ) Relational victimization ( F (4, 350) = 7.2, p &lt; .001 ) ( M's = 2.69 ) rejected, 2.39 avg, 1.99 neglect, 2.53 controll Overt victimization ( F (4, 350) = 2.5, p &lt; .05 ) ( M = 2.54 ) rejected ( M's = 2.03 ) popular, 2.03 controll Target of prosocial acts ( F (4, 350) = 3.3, p &lt; .01 ) ( M's = 3.06 ) rejected, 3.54 popular (Ms with different superscripts, differ ( p &lt; .05 ) (MANOVA, ANOVA, Student Newman-Keuls)</td>
</tr>
</tbody>
</table>
Peer Influences—Peer Victimization

Peer Attribution

Authors: Dodge and Frame
Year: 1982
Design: Concurrent group comparisons

<table>
<thead>
<tr>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source specific: selected boys rated by teachers highest on aggression &amp; by peers lowest on liking (rejected) &amp; matched by race sample rated lowest on aggression &amp; highest on prosocial behavior; semi-rural school</td>
<td>81</td>
<td>K-5th gr</td>
<td>100%</td>
<td>N/R</td>
<td>20% Cauc</td>
<td>Boys attributed more hostile intentions for instigating the same outcomes &amp; indicated more aggressive retaliation toward aggressive than nonaggressive peers. In a replication study, children were more likely to indicate that boys labeled aggressive would commit a future hostile act than boys labeled popular or not labeled. Aggressive boys who were the target of negative or ambiguous story outcomes attributed more hostility to the instigator than nonaggressive boys. Although there were no differences when the outcome was directed at another peer. Aggressive boys indicated more aggressive retaliation to stories than nonaggressive boys.</td>
</tr>
</tbody>
</table>

Key Statistics

Behavior, Agg Status, Intention, Retaliation
F (1, 75) = 4.48, p < .04
M's = 1.48 agg, 1.38 nonagg
Study 1: Hostile Attributions About Agg
F (1, 75) = 4.34, p < .05
M's = 1.48 agg, 1.38 nonagg
Study 1: Aggressive Retaliation on Boys
F (1, 75) = 4.22, p < .01
M's = 1.32 agg, 1.26 nonagg
Study 1: Aggressive Retaliation by Agg
F (1, 75) = 3.20, p < .08
M's = 1.34 agg, 1.23 nonagg
Study 1: Agg Status & Hostile Attribution
F (1, 75) = 6.51, p < .02
Agg M = 1.52 agg, self-directed
Agg M = 1.37 nonagg, other directed
Agg M = 1.43 agg, other directed
Agg M = 1.43 nonagg, other directed
Study 2: Future Hostile Acts, Agg Status
F (2, 148) = 61.75, p < .001
M's = .59 agg, .35 no label, .20 pep
*Means = approximate M's from figure (ANOVA, Newman-Keuls post hoc)

Behavior, Agg Status, Intention
F (1, 72) = 2.64, p < .08 (agg x int)
F (1, 72) = 6.56, p < .02 aggression
M's = 2.36 agg, 1.58 nonagg, ambiguous
M's = 1.88 agg, 1.76 nonagg, benign
M's = 2.75 agg, 2.53 nonagg, hostile
(ANOVA, Newman-Keuls post hoc)

Hypothetical Situation, Attributions of Hostile Intent & Status of Peer Target
F (1, 84) = 46.51, p < .0001
Aggressive subjects
M's = 1.10 agg peers, 1.08 nonagg
Nonaggressive subjects
M's = 1.31 agg peers, 1.03 nonagg
Hypothetical Situation, Retaliation
F (1, 84) = 19.37, p < .0001
Aggressive subjects
M's = 1.48 agg peers, 1.31 nonagg
Nonaggressive subjects
M's = 1.39 agg peers, 1.20 nonagg
(ANOVA)
### Peer Influences—Peer Victimization

#### Peer Attribution

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Concurrent group comparisons</th>
<th>Data collected</th>
<th>8 times over</th>
<th>T1 not used to predict T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dodge &amp; Frame</td>
<td>1982</td>
<td>Study 3, recruited volunteers from 6 schools in small Midwestern town</td>
<td>48</td>
<td>2nd gr</td>
<td>100%</td>
<td>Low-middle</td>
</tr>
<tr>
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</tbody>
</table>

#### Key Statistics

- Study 3: Agg Status by Initiator or Agg (F (2, 34) = 2.95, p < .06 (agg x initiat))
- F (2, 45) = 6.53, p < .01 (aggression)
  - Aggressive boys, verbal aggression 28.3 initiates, 28.2 receive, +48%
  - Aggressive boys, physical aggression 4.3 initiates, 3.6 receive, +19%
  - Average boys, verbal aggression 17.7 initiates, 18.3 receive, -4%
  - Average boys, physical aggression 1.9 initiates, 2.1 receive, -10%
  - Nonaggressive boys, verbal aggression 7.5 initiates, 9.1 receive, -18%
  - Nonaggressive boys, physical aggression 1.7 initiates, 2.7 receive, -37%

#### Perry, Kusel, & Perry

- 1988 Prospective longitudinal Cohen
- 3 mths
- Convenience: children from university school in middle-class school district
- 165 3rd-4th gr 50% Middle N/R Peer-related victimization (verbal & physical) was associated with more peer-related rejection & less peer-related acceptance. Rejected children had higher victimization scores than children rated by their peers as popular, average, or controversial.

#### Victimization & Criminal Offending

<table>
<thead>
<tr>
<th>Estberg &amp; Husinga</th>
<th>1991</th>
<th>Retrospective group comparisons</th>
<th>prevalence, past year, &amp; lifetime</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Population: recruited youth from households with 7, 9, 11, 13, &amp; 15 yr olds; stratified probability sample from socially disorganized high-crime neighborhoods; Denver, CO; Denver Youth Survey</td>
<td>877</td>
<td>11, 13, &amp; 15 yrs</td>
<td>100%</td>
<td>Low</td>
<td>33% AFA 11% Cauc 45% Hisp 12% Other (Amer, NAta) (includes 7 &amp; 9 yr olds)</td>
<td></td>
</tr>
<tr>
<td>Self-reports of lifetime personal (assault) and/or property (theft) victimization were higher for youths reporting a history of delinquency (minor &amp; felony assault, theft, alcohol &amp; marijuana use, &amp; drug sales) than for nondelinquent youth. The likelihood of victimization increased with increases in the variety &amp; number of delinquent behaviors. Among youth victimized in the past year, those involved in delinquent activities reported higher rates of personal or property victimization in the past year than did nondelinquent youths.</td>
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</tbody>
</table>

#### Key Statistics

- Lifetime Prevalence of Personal Property Victimization & Delinquency:
  - 24%, 35% no delinquent acts
  - 39%, 44% 1 type of delinquent act
  - 45%, 48% 2 types of delinquent acts
  - 51%, 67% 3-5 types of delinquent acts
  - 60%, 68% 6 types of delinquent acts
  - (order of: peronal, property victim) (CH-squares not reported, p's < .001)

- Last Year Frequency Personal Victimization
  - M's = 1.74 median, 3.63 delinquent

- Last Year Frequency Property Victimization
  - M's = 1.95 median, 3.40 delinquent

(ANOVA, F's not reported, p's < .05)
Peer Influences—Peer Victimization
Victimization & Criminal Offending

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age % Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampson &amp; Lauritsen</td>
<td>1990</td>
<td>Concurrent</td>
<td>Randomly selected 16+ person from households in 238 (1992) &amp; 300 (1984) electoral districts, England &amp; Wales, for a national representative sample; British Crime Survey</td>
<td>21,935</td>
<td>16 yrs N/R Low</td>
<td>2% AFA</td>
<td>95% Cau</td>
<td>3% Other</td>
<td>1992 Cohort: Victimization &amp; Offending $\chi^2(8) = 339.01$</td>
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<td>Risk of self-reported personal &amp; household victimization (assault, theft, or vandalism) was related to self-reported offending (violence, theft, or vandalism) area crime rate, male gender, &amp; age, taking into account college education, single marital status, &amp; lifestyle (drinking behavior &amp; number of nights out per week). In a modified replication study, risk of victimization was related to minor self-reported deviance, taking into account the above-mentioned variables.</td>
<td>$\beta = .25, p &lt; .001$ offending</td>
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<td></td>
<td>$\beta = .43, p &lt; .001$ high crime</td>
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<td></td>
<td></td>
<td>$\beta = .23, p &lt; .01$ male</td>
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<td></td>
<td></td>
<td></td>
<td>$\beta = -.02, p &lt; .001$ age</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$\beta = .07, p &lt; .001$ college education, drinking, nights out, single</td>
</tr>
</tbody>
</table>

1984 Cohort: Victimization & Minor Deviance

$\chi^2(8) = 339.46$

$\beta = .21, p < .05$ minor deviance

$\beta = .12, p < .001$ high crime

$\beta = .26, p < .01$ male

$\beta = .03, p < .001$ age

$\beta = .37, p < .001$ college education

Self-Reported Assault & Victimization

$\chi^2(12) = 10.65, p = .36$

$r = .77$ victimization

$r = .63$ gang membership

$r = .49$ weapon use

Adult Arrest Record

69% victim, 27% nonvictm

(Dr. Math, Goodman's coefficient of multiple determination)

Social Cluster Analysis

30% agg, 35% ctrl nuclear

45% agg, control secondary

20% agg, control peripheral

5% agg, 9% ctrl isolated Peer Isolation: 10% agg, 8% ctrl

Reciprocal Best Friend: 43% agg, ctrl

(Dr. Math, not reported, $\beta = na$)

Popularity, Teacher Ratings

$F(1, 36) = 21.08, p < .001$

$M^2 = 4.12$ agg, 2.73 nonagg 4th boys

$M^2 = 4.32$ agg, 3.33 nonagg 4th girls

$M^2 = 4.21$ agg, 3.73 nonagg 7th boys

$M^2 = 4.53$ agg, 3.13 nonagg 7th girls

Best Friend Aggressiveness

$r = .63, p < .01$ reciprocal 4th boys

$r = .43, p < .01$ reciprocal 7th boys

$r = .51, p < .01$ reciprocal 7th girls

$r = .40, p < .01$ nonreciprocal 7th boys (ANOVA, correlations)

Peer Enhancement—Peer Selection

Carns, et al. | 1988 | Concurrent group comparisons |

Convenience: randomly sampled 10% of participants from earlier study of males born in 1945, Philadelphia, PA

567 | 26 | 100% Low-middle N/R AFA N/R Cau

The probability of committing a serious assault was related to retrospective reports of victimization (confined here to serious assault with a weapon—shooting or stabbing), gang membership, & weapon use. Victims were more likely to have an adult arrest record than nonvictims.

Peer Selection

Source specific recruited 695 children from 4 elementary & 3 middle schools in suburban & rural areas of 2 counties; selected 40 children rated as highly aggressive by school personnel & nonaggressive controls matched on gender, race, SES, age, size, & classroom

80 | 4th & 7th 50% Low-upper M = 30.9 (7-48) | 75% Cau 24% Minority (novelty AFA) Duncan scale

Highly aggressive children & nonaggressive matched controls (based on school personnel ratings) were equally distributed among nuclear, secondary, peripheral, & isolated status in social clusters. Aggressive children did not differ on peers' judgment of isolation or number of times chosen as a reciprocal best friend, although they were rated by teachers as less popular than controls. Ratings of aggression were similar for best friend boys in 4th & 7th grade, 7th-grade girls, & 7th-grade nonreciprocal boy best friends.
Peer Influences—Peer Enhancement
Peer Selection

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Characteristics</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giordano, Cemkovich, &amp; Pugh</td>
<td>1986</td>
<td>Concurrent group comparisons</td>
<td>Population: youth from private households, large north central SMSA* multistage modified probability sampling stratified by race, average housing value, then by gender &amp; race</td>
<td>884</td>
<td>12-19 yrs</td>
<td>49%</td>
<td>Low-middle</td>
<td>53% AFR</td>
<td>47% Cau</td>
<td>There were no significant differences in self-reported friendship stability (average length of time being friends) for nonoffenders, low &amp; high frequency minor offenders &amp; low &amp; high frequency major offenders, controlling for age. *SMSA: American Standard Metropolitan Statistical Area</td>
</tr>
<tr>
<td>Haselager, Hartup, et al.</td>
<td>1998</td>
<td>Concurrent group comparisons</td>
<td>Convenience: recruited children from 102 classes, 51 elementary &amp; 8 special education schools in the Netherlands; included target child, 1 mutual same-sex friend, &amp; 1 nonfriend of target</td>
<td>576</td>
<td>4th-8th grade</td>
<td>50%</td>
<td>Low-middle</td>
<td>90% Cau</td>
<td>10% Other* (Dutch)</td>
<td>Friends were more similar than nonfriends &amp; boys were more similar than girls on classmates' ratings of antisocial behavior (starts fights, disrupts, &amp; bullies). Friends showed more similarity for antisocial behaviors than prosocial behaviors, shyness/dependency, or sociometric measures. Friends did not differ from nonfriends on ratings of social acceptance.</td>
</tr>
<tr>
<td>Kuipersmidt, Burchinal, &amp; Patterson</td>
<td>1995</td>
<td>Prospective longitudinal study</td>
<td>Convenience: recruited all 2nd-4th graders in school system, small southern city; 62% of population sampled</td>
<td>880</td>
<td>3rd-4th grade &gt; 5th-7th grade</td>
<td>48%</td>
<td>Low-MR/R</td>
<td>40% Low</td>
<td>60% N/R</td>
<td>Students rated by peers as having an aggressive best friend, high rates of conflict with this friend, or who were rejected by peers were at greater risk for delinquency 4 yrs later (teacher or self-reports)</td>
</tr>
</tbody>
</table>

* Note: SMSA: Standard Metropolitan Statistical Area.
### Peer Influences—Peer Enhancement

#### Peer Selection

| Authors          | Year | Design                  | Representation
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Tremblay, Masoe, et al.</td>
<td>1995</td>
<td>Concurrent cross-sectional sequential; data collected over 3 yrs; T1 not used to predict T2</td>
<td>Population: recruited boys in 53 public schools, low-SES areas, Montreal, Canada; boys who had Canadian-born, French-speaking parents &amp; a mutual friend were eligible</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Representativeness</th>
<th>Size</th>
<th>Age 10, 11, &amp; 12 yrs</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,034</td>
<td>10, 11, &amp; 12 yrs</td>
<td>100%</td>
<td>Low</td>
<td>100% Canuc (French Canadian)</td>
</tr>
</tbody>
</table>

| Result | Peer ratings of aggression were similar for boys & their friends at ages 10, 11, & 12. Boys' friends' belief at ages 10, 11, & 12 were taken into account. |

#### Associative Pairing

| Knuepfer, Moffitt, et al. | 1990 | Concurrent longitudinal | Convenience: recruited at age 21 from Dunedin study participants & their parents of 6 mths or more; original sample: consecutive births, spring, 1972-1973, Dunedin, New Zealand |

<table>
<thead>
<tr>
<th>Size</th>
<th>Age 21 yrs</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>360</td>
<td>21 yrs</td>
<td>50%</td>
<td>N/R</td>
<td>N/R Pac Is</td>
</tr>
</tbody>
</table>

| Intimate partners at age 21 had similar self-reports of antisocial behavior, including variety of offenses & peers' delinquency. They also had similar attitudes about the consequences of crime. |

#### Key Statistics

- Boys' Friends' Aggressiveness
  - $\beta = .48, p < .05$ age 10
  - $\beta = .258, p < .05$ age 11
  - $\beta = .258, p < .05$ age 12

- Structural equation model

#### Assortative Mating & Antisocial Behavior

- $r = .54, AGFI = .96$ variety of offenses
- $r = .54, AGFI = .99$ peers' delinquency

- Assortative Mating & Attitudes
  - $r = .23, AGFI = .91$ risk of being caught
  - $r = .20, AGFI = .97$ sanctioned by job
  - $r = .45, AGFI = .99$ sanctioned by partner
  - $r = .38, AGFI = .99$ sanctioned by family

- $r = .42, AGFI = .99$ sanctioned by friends
  - $\gamma = $ assortative mating coefficient
  - $AGFI = $ adjusted goodness of fit index

#### Quinton, Pickles, et al. 1993

<table>
<thead>
<tr>
<th>Prospective longitudinal</th>
<th>15 yrs approximate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience: 4 samples, (1) young adults raised in children's homes; (2) quasi-random low-SES comparison group; (3) random pop sample of 10 yr olds; (4) children high on behavioral problems; all from inner-city London</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Age 10 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>150-352</td>
<td>T1</td>
</tr>
</tbody>
</table>

| A supportive nondeviant partner at age 21 interrupted the continuity between conduct disorder in children (measured by teacher & retrospective self-reports at age 10) & adult criminal convictions. Childhood conduct disorder (retrospective report) & antisocial peers increased the risk of having a 1st partner who was deviant. |

#### Yamaguchi & Kandel 1993

<table>
<thead>
<tr>
<th>Retrospective longitudinal lifetime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience: recruited 50% of participants in earlier study &amp; their partners, married or cohabitating: 1st recrual at 10th-11th graders, 18 publ. high schools, NY, 1971-1972</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Age 26-31 yrs</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>545</td>
<td>26-31 yrs</td>
<td>50%</td>
<td>N/R</td>
<td>N/R Pac Is</td>
</tr>
</tbody>
</table>

| There was moderate concordance between partners on measure of illicit drug use over the lifetime, prior to marriage, & in the past 12 mths for adults who had used a class of drug 10 or more times. Latent trait log-linear models controlling for population heterogeneity indicated that this concordance was due to assortative mating, not socialization. |

#### Key Statistics

- Concordance of Drug Behavior, Partners
  - $K = .34$ ever lifetime
  - $K = .34$ ever prior marriage
  - $K = .43$ last 12 mths

- (see study for log-linear models (weighted kappas))
### Peer Influences—Peer Enhancement

#### Peer Reinforcement

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snyder &amp; Brown</td>
<td>1983</td>
<td>Prospective longitudinal 6 wks</td>
<td>20</td>
<td>3-5 yrs</td>
<td>50%</td>
<td>Low</td>
<td>Low 50% Cauca.</td>
<td>In day care setting were more likely than children rated as nonoppositional to receive aversive behavior (responsible for a positive antecedent); respond to negative consequences; &amp; continue aversive behavior once begun. Oppositional children were also more likely to receive aversive stimuli.</td>
</tr>
</tbody>
</table>

Snyder, Horsh, & Childs | 1997 | Prospective longitudinal 4 mths | 72 | 49-62 mths | 50% | Low | 100% AFR | Aggressive behavior increased over a 4 mth period for children who received a substantial amount of teacher ratings (teacher ratings or other ratings) or a moderate amount of teacher ratings of time with aggressive peers. |

### Bullying

#### Farrington 1993

| Population: Sampled boys ages 8-9 yrs from state primary & 1 special ed school in working-class area of London. 1961-1982; Cambridge Study in Delinquent Development | 378 | 14 yrs | 100% | Low | 21% | 199 yrs | Bullying at age 14 predicted bullying at age 20, independent of aggression at 14 or 32. Self-reports of bullying at age 32 were almost twice as likely for boys who had reported bullying at age 14, & almost 5 times as likely for boys who reported bullying at 18. Men who reported bullying at age 32 were more likely to have been convicted of a violent crime. |

#### O'Connell, Pepler, & Craig 1999

| Convenience: Recruited from 2 preschools, Toronto, Canada: male 53, female stratified sample of bullies, victims, bully-victims, & comparison-children; based on self-peer, or teacher nomination; included focal & nonfocal children. | 219 | 5-12 yrs | N/R | N/R | N/R | Viedeotape of playground behaviors showed peers' influence on bullying: the duration of a bullying episode increased as the number of peers present increased, peers actively & passively reinforced bullying episodes, & peers viewed in bullying episodes. Older boys were more likely than older girls or younger boys to join the bully, while younger & older girls were more likely to support the victim than older boys. |

#### Key Statistics

- **Aggression, Teacher Ratings**
  
  $F(2, 69) = 13.30, p < .001$
  
  Aprior $M = 1.12, 1.40$ substantial > 30%
  
  Aprior $M = 0.70, 1.40 moderate 15-20%

- **Aggression, Observed**
  
  $F(2, 69) = 5.03, p < .05$
  
  Aprior $M = 0.70, 1.1$ substantial > 30%
  
  aprior approx M's T1 & T2 from figure (ANOVA's)

- **Aggression & Bullying at Ages 14 & 32**
  
  Likelihood ratio $\chi^2 = 4.5, p = .04$

- **Bullying Age 14 & Bullying Age 32**
  
  OR = 1.90, $\chi^2 = 4.50, p = .017$

- **Bullying Age 18 & Bullying Age 32**
  
  OR = 4.83, $\chi^2 = 28.3, p = .0001$

- **Bullying Age 32 & Violent Crimes by 32**
  
  OR = 2.18, $\chi^2 = 4.31, p = .019$

#### Peers Present & Bullying Duration

$\chi^2 = 23, p < .05$

Reinforcement 21% active, 54% passive

Peers & Intervention 25-4%

Gender, Grade on Bullying

F(1, 120) = 6.5, p < .02

Aprior $M = 17.30, 17.60, 17.80, 18.00, 18.20$

Gender, Grade on Victim Support

F(1, 120) = 4.7, p < .05

Aprior $M = 13.70, 14.00, 14.30, 14.60$

y = younger, o = older, b = boys, g = girls

aprior approximate M's from figures (correlations, ANOVA's)
### Peer Influences—Peer Enhancement Deviant Peers

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample Information</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>% Female</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamberlin &amp; Reid</td>
<td>1999</td>
<td>Intervention random assignment 1 yr followup 46 refused referred by juvenile justice system for community placement, metro area of mislabeled Pacific NW city</td>
<td>Source specific: chronic delinquent boys referred by juvenile justice system for community placement, metro area of mislabeled Pacific NW city</td>
<td>79</td>
<td>12–17 yrs</td>
<td>100%</td>
<td>H/R</td>
<td>80% A/MA</td>
<td>6% Hsp</td>
<td>3% N/A</td>
<td>Boys who participated in multidimensional tx foster care (MTC) showed a greater reduction in rate of official criminal referrals &amp; reported less delinquency, index offenses, &amp; felony assaults in the year following treatment than boys who received group care (GC). Participation in MTC predicted official referral rate, self-reported delinquency, index offenses, &amp; felony assaults, even after accounting for age of first offense, age at baseline, &amp; pre-treatment offense rates.</td>
</tr>
<tr>
<td>Dishion &amp; Andrews</td>
<td>1995</td>
<td>Intervention random assignment 1 yr followup 4 bx groups (family, peer, family &amp; peer, self-directed) &amp; 1 quasi-experimental control</td>
<td>Convenience: self-referred families recruited through ads, peers, &amp; community professionals; eligible at-risk children had at least 4 out of 10 possible risk factors; Adolescent Transitions Program</td>
<td>158</td>
<td>60–8th gr</td>
<td>53%</td>
<td>Low-mid</td>
<td>50%</td>
<td>receive aid</td>
<td>50%</td>
<td>12 yrs</td>
</tr>
</tbody>
</table>
| Dishon, Eddy, et al. | 1997 | Perspective longitudinal 8–9 yrs T1: discipline & antisocial behavior T2–4: deviancy training & violence | Population: recruited from 2 birth cohorts of 4th grade boys attending randomly selected school in 10 neighborhoods with highest delinquency rates, metro area, mistate OR city; Oregon Youth Study | 194 | 9–10 yrs | 100% | Low-mid | 20% | receive aid | T1 | (predominantly Caucasian) | Adolescent peer deviancy training (ages 13–18) predicted police contact for violent arrests & self-reported violence, controlling for childhood antisocial behavior (child/teacher reports) & childhood parental coercive discipline (observed). | &lt;strong&gt;Key Statistics&lt;/strong&gt;  
Rate of official Criminal Referrals  
$F(1, 77) = 3.06, \ p = .003$ group x time  
$R^2 = .15, \ \beta = -2.1, \ t = .12, \ p = .22, \ M^2 = .027$ MTC 6.7, 5.8 GC  
Delinquency, Self-Report  
$F(1, 77) = 5.66, \ p = .03$  
$R^2 = .24, \ \beta = .13, \ t = 2.24, \ p = .04$  
$M^2 = 12.8$ MTC, 28.9 GC  
Index Offenses, Self-Report  
$F(1, 77) = 5.3, \ p = .03$  
$R^2 = .25, \ \beta = -2.3, \ t = -2.05, \ p = .04$  
$M^2 = 12.8$ MTC, 28.9 GC  
Pelvic Assault, Self-Report  
$F(1, 77) = 4.15, \ p = .05$  
$R^2 = .20, \ \beta = 2.7, \ t = -2.05, \ p = .02$  
$M^2 = 1.2$ MTC, 2.7 GC  
(regression, step 1: age 1st criminal referral, step 2: age at baseline, step 3: pretreatment criminal referral rate, step 4: treatment group) (ANOVA, Hierarchical multiple regression)  
Externalizing, Teacher Report  
Post-bx $F(1, 125) = 3.44, \ p = .06$  
$M^2 = 13.3$ pre, 23.2 post, parent  
1 yr followup $F(1, 125) = 3.94, \ p = .05$  
Post hoc $F(1, 125) = 4.79, \ p < .05$  
$M^2 = 10.5$ pre, 13.1 post, group  
$M^2 = 10.5$ pre, 11.3 post, parent & teen  
Delinquency, Teacher Report  
1-yr FU apx $M^2 = 3.8$ teen, 2.3 control  
2-yr FU apx $M^2 = 3.3$ teen, 2.1 control  
3-yr FU apx $M^2 = 4.2$ teen, 2.6 control  
axp = approximate means from figure (covariate: baseline externalizing) (ANCOVAs, M's for delinquency not reported)  
Peer Deviancy Training & Violence  
Police contact, violent arrests $x^2 (191) = 176.9, \ p = .76$  
| Beta | .78 | OR = 2.14  
$PS = \text{child antisocial behavior, discipline}$ (logistic regression analysis)  
Violence, self-report  
Multiple $R^2 = .57$  
$R^2 = .32, \ p = .1, \ p < .001$  
$\beta = .29$ peer deviancy training  
$\beta = .44$ child antisocial behavior  
$P = \text{parental discipline}$ (multiple regression analyses)
### Peer Influences—Peer Enhancement
#### Deviant Peers

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design/Intervention</th>
<th>Conveniences</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dishon, McCord, &amp; Paulin</td>
<td>1999</td>
<td>Retrospective, random assignment</td>
<td>Cambridge-Somerville Youth Study; matched pairs of boys from high-crime &amp; impoverished areas of eastern MA; to 1936-1939 to 1943, 40 yr followup</td>
<td>250</td>
<td>M = 10.5 &gt; M = 47 yrs</td>
<td>100%</td>
<td>Low</td>
<td>N/R</td>
<td>Boys sent to summer camp for more than 1 summer as part of a 5.5-yr treatment intervention had a 10:1 risk of having an undesirable outcome (defined as being convicted of a serious crime, dying by age 35, or being diagnosed with alcoholism or a psychiatric illness), compared to untreated matched peers. See Dishon &amp; Andrews, 1995, for Adolescent Transitions Program results.</td>
<td></td>
</tr>
<tr>
<td>Elliott, Huizinga, &amp; Menard</td>
<td>1989</td>
<td>Prospective longitudinal, 1 yr</td>
<td>Population: probability sample of U.S. households, representative of 11-17 yr olds according to U.S. Census Bureau; National Youth Survey</td>
<td>1,725</td>
<td>13-18 yrs</td>
<td>50%</td>
<td>Low-upper</td>
<td>N/R% AA/N/R% Cau/N/R% Other</td>
<td>Delinquent peer group bending &amp; gender (males) predicted level of self-reported general delinquency &amp; index offending, taking into account SES, age, race, cohort size, rural-urban residence, occupational school strain, internal bonding (family, school, &amp; belief), &amp; external bonding (family &amp; school involvement).* Results were replicated the following year. *Variables included in analyses (see study for beta for male gender) (path analysis, OLS regression)</td>
<td></td>
</tr>
<tr>
<td>Keener, Loeb, et al.</td>
<td>1995</td>
<td>Prospective longitudinal, concurrent</td>
<td>Convenience/Source specific: randomized sample recruited from inner-city public schools, Pittsburgh, PA; 12 high risk for behavior problems, 1/2 randomly selected from remainder</td>
<td>1,014</td>
<td>4th &amp; 7th gr</td>
<td>100%</td>
<td>Low-middle</td>
<td>M = 36.5 Hollingshead</td>
<td>Boys who reported that all or most of their peers had conflicts with authority were twice as likely to have conflicts with authority themselves. Similarily, boys with peers involved in overt or covert delinquency were 3 &amp; 4 times more likely to also be involved. Predictive findings indicate that boys previously exposed to peers engaged in authority conflicts were 1.5 times more likely to have conflicts with authorities later on, while boys previously exposed to peers who engaged in overt or covert delinquency were twice as likely to engage in either one of these behaviors. Effects remained after accounting for parental supervision, parental warmth, &amp; grade.</td>
<td>Concurrent, Peers, Conflict With Authority $\chi^2 = 38.33$, $p &lt; .001$ $\beta = .30$, OR = 2.2, $p = .001$ Concurrent, Peers, Covert Behavior $\chi^2 = 112.30$, $p &lt; .001$ $\beta = .145$, OR = 4.3, $p = .001$ Predictive, Peers, Conflict With Authority $\chi^2 = 19.79$, $p &lt; .001$ $\beta = .35$, OR = 1.4, $p &lt; .05$ peers $\beta = .31$, OR = 1.4, $p &lt; .05$ supervision $\beta = .40$, OR = 1.5, $p &lt; .05$ warmth Predictive, Peers, Covert Behavior $\chi^2 = .94$, $p &lt; .001$ $\beta = .70$, OR = 2.3, $p = .00$ peers $\beta = .60$, OR = 2.3, $p = .00$ grade $\beta = .36$, OR = 1.4, $p = .065$ supervision Predictive, Peers, Overt Behavior $\chi^2 = 10.20$, $p &lt; .05$ $\beta = .60$, OR = 1.8, $p = .006$ peers (logistic regressions)</td>
</tr>
</tbody>
</table>
## Peer Influences—Peer Enhancement

### Deviant Peers

<table>
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<tr>
<th>Authors</th>
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<th>Size</th>
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<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patterson</td>
<td>1993</td>
<td>Prospective</td>
<td>206</td>
<td>4th</td>
<td>100%</td>
<td>Low-middle</td>
<td>N/R</td>
<td>Initial level of antisocial behavior in grade 6 (intercept, parent-child self-report) was associated with ineffective parental discipline &amp; monitoring. Growth in antisocial behavior from 4th to 8th grade (slope) was related to increased deviant peer involvement &amp; wandering. Deviant peer involvement continued to predict increased antisocial behavior, after controlling for wandering.</td>
</tr>
</tbody>
</table>

### Gangs

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
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<th>Size</th>
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<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Jongsgard &amp; Smith</td>
<td>1993</td>
<td>Concurrent</td>
<td>969</td>
<td>13-15.5</td>
<td>73%</td>
<td>N/R</td>
<td>68% AfA</td>
<td>Male female adolescent gang members reported higher prevalence &amp; incidence rates of serious, moderate, &amp; minor delinquency than adolescents who were not affiliated with a gang. Male gang members reported higher prevalence &amp; incidence of serious delinquency &amp; higher incidence of moderate &amp; minor delinquency than female gang members.</td>
</tr>
</tbody>
</table>

### Key Statistics

- Parenting & Antisocial Behavior
  \[ R^2 = .68, .71, .73, .76 \]
  - (4th, 6th, 7th, & 8th grades)
  - Intercept, antisocial behavior
  \[ R^2 = .35 \]
  - for monitor/discipline
  \[ R^2 = .31 \]
  - for deviant peer wandering
  \[ R^2 = .43 \]
  - deviant peer change 4th-8th gr
  \[ R^2 = .31 \]
  - wandering change 4th-8th gr

- Moderately Disruptive Boys & Friends
  \[ F(3, 129) = 3.28, \ p = .01 \]
  - M = 34.9 aggressive-disruptive
  - M = 31.5 average
  - M = 31.2 nonaggressive
  - M = 32.1 no friends

- Highly Disruptive Boys & Friends
  \[ F(3, 127) < 1.00, \ p = .ns \]
  - (covariates: previous delinquency, parental occupational prestige)

- Moderate vs. Highly Disruptive Boys
  \[ F(1, 170) = 1.28, \ p = .ns \]
  - (covariates: parental occupational prestige, ANCOVA, post hoc tests not reported)

- Serious Delinquency—Incidence
  \[ M^2 = 3.7 \text{~gf,} \ 6.6 \text{~nf,} \ 6.5 \text{~gm,} .03 \text{~nm} \]

- Serious—Prevalence, 1+ (%)
  \[ M^2 = 67.6 \text{~gf,} \ 6.6 \text{~nf,} \ 80 \text{~gm,} 11 \text{~nm} \]

- Moderately Delinquent—Incidence
  \[ M^2 = 6.2 \text{~gf,} \ 1 \text{~nf,} \ 14 \text{~gm,} 3.9 \text{~nm} \]

- Moderately Delinquent—Prevalence (%)
  \[ M^2 = 68.6 \text{~gf,} \ 32 \text{~nf,} \ 76 \text{~gm,} 38 \text{~nm} \]

- Minor Delinquency—Incidence
  \[ M^2 = 11 \text{~gf,} \ 2.9 \text{~nf,} \ 22 \text{~gm,} 3.2 \text{~nm} \]

- Minor Delinquency—Prevalence (%)
  \[ M^2 = 65 \text{~gf,} \ 38 \text{~nf,} \ 72.7 \text{~gm,} 36 \text{~nm} \]

- \[ \text{If} = \text{f, gang vs. nongang, f = female, m = male} \]

- (no other statistics reported)
Peer Influences—Peer Enhancement
Gangs

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<tr>
<th>Authors</th>
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<th>Population</th>
<th>Size</th>
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<th>% Male</th>
<th>SES</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Eshleman &amp; Huizinga</td>
<td>1993</td>
<td>Prospective longitudinal</td>
<td>4 yrs</td>
<td>households with age 7, 9, 11, 13, 15 youth; stratified probability sample from socially disorganized high-crime neighborhoods; Denver, CO; Denver Youth Survey</td>
<td>1,114</td>
<td>7, 9</td>
<td>52%</td>
<td>N/A</td>
<td>31% AFA</td>
<td>Prevalence of street &amp; serious offending and individual rates of offending were higher during active gang membership than prior to joining or after leaving a gang. Rates of offending were higher for gang than nongang members before, during, &amp; after active gang membership.</td>
</tr>
</tbody>
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<th>Population</th>
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<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
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<tbody>
<tr>
<td>Thornberry, Knuth, et al.</td>
<td>1993</td>
<td>Prospective longitudinal</td>
<td>42 mths, 6-mth intervals, waves 2-7</td>
<td>recruited from all 7th &amp; 8th graders in public schools, Rochester, NY; oversampled high-risk youth (male, high-crime areas)</td>
<td>987</td>
<td>8th &amp; 9th</td>
<td>100%</td>
<td>Low-upper</td>
<td>64% AFA</td>
</tr>
</tbody>
</table>

Key Statistics
Prevalence, Street Offenses
Gang members during yr 3 only
Yr 1: <3 gang, 13 nongang (n = 799)
Yr 2: 4 gang, 14 nongang (n = 765)
Yr 3: 90 gang, 15 nongang (n = 1,091)
Yr 4: 77 gang, 15 nongang (n = 1,096)
(chi-square, gang vs. nongang, all p's < .05)
Individual, street offending—Yr 3
Yr 1: 13.9 gang, 2.0 nongang
Yr 2: 20.5 gang, 2.0 nongang
Yr 3: 34.5 gang, 5.7 nongang
Yr 4: 22.9 gang, 4.2 nongang
(see study for additional results)
(f tests, gang vs. nongang, all p's < .05; temporal tests not conducted)

General Delinquency
Transient (n = 51) vs. nongang
Cross-time: p's = .01, .003, ns
Cross-group: p's = .002, .047, ns
Stable T1 & T2 (n = 24) vs. nongang
Cross-time: p's = .001, .08
Cross-group: p's = .002, .047, ns
M's = 4.7, 3.2, 5.1 nongang
M's = 18.0, 7.7, 6.8 transient
M's = 26.7, 17.3, 13.3 stable

Crimes Against Persons
Transient vs. nongang members
Cross-time: p's = .007, .003, ns
Cross-group: p's = .001, ns, ns
Stable T1 & T2 vs. nongang members
Cross-time: p's = .004, .001
Cross-group: p's = .002, .001, ns
M's = 2.7, 2.3, 3.4 nongang
M's = 13.4, 5.6, 5.1 transient
M's = 17.3, 12.6, 3.7 stable
*
order of p's, cross-time
T1 vs. T2, T2 vs. T3, T3 vs. T3
**order of p's, cross-group: T1, T2, T3
(see study for additional results)
(f tests)
Broader Social Environment, Communities, and Schools

Research on the impact of community and broader social environmental factors differs from research discussed in other areas of this report in several fundamental ways. First, many of the community and social environmental features that elevate risk for externalizing behavior problems operate in a cluster. That is, while one can statistically identify distinct factors (e.g., minority group membership, economic disadvantage), in reality, risk of youth conduct problems is particularly elevated in social areas characterized by a confluence of these structural features.

Second, in other sections of this report, assessments of risk are associated with individual variation in externalizing behavior problems and conduct problems. However, research examining the influence of community and broader social environment factors traditionally has focused on rates of violence and crime across particular geographic entities rather than on individual variation. For example, neighborhoods characterized by high rates of unemployment often have a high overall crime rate. These variables may not be strong in predicting which youth will exhibit externalizing behavior problems. However, the “strain” associated with the inability to achieve along traditional educational and occupational lines may be an important contextual factor influencing antisocial behavior.

Broader Social Environment

Within the broader social environment, two key factors have been related to aggression and delinquent behavior—culture and SES. Indeed, it can be very difficult to distinguish the effects of these two factors because SES is frequently confounded with ethnic membership. As noted above, it may be the interaction of culture and SES that is most germane to youth conduct problems. Given this caveat, cross-cultural research on aggression and violence has shown American culture to be more accepting of aggressive behavior (Hartz, 1995; Kumagai & Straus, 1983) compared with other cultures. This can be particularly striking within some U.S. subcultural groups (Heimer, 1997), such as street gangs (Bjerregaard & Smith, 1993; Esbensen & Huizinga, 1993; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993). Research on lower SES and poverty consistently shows these variables to correlate with elevated rates of crime (Heimer, 1997). Rates of crime are likely to increase where there is a decline in access to jobs or where unemployment is high (Almgren, Guest, Immerwahr, & Spittel, 1998; Catalano, Novaco, & McConnell, 1997).

Economic discrimination also is associated with increased violence (Messner, 1989). In the criminal justice system, lower SES and minority youth were
more likely to be referred to court and to receive more intensive police scrutiny than higher SES and Caucasian youth (Sampson, 1986).

**Communities and Neighborhoods**

Studying the impact of communities and neighborhoods on children, researchers have examined three major features: (1) structural and demographic features, (2) exposure to situations or events, and (3) community-level processes and forms of social control. In terms of structural and demographic features, research on the extent to which neighborhoods are characterized by deteriorating housing (Spelman, 1993), overcrowding (Wallace, 1990), greater population density, and greater numbers of female-headed households (Harries & Powell, 1994; Smith & Jarjoura, 1988) consistently shows correlations with neighborhood crime rates and violence.

Children and young people who live in deteriorating neighborhoods with higher crime rates are more likely to be exposed to and witness robberies, assaults, and murders. Experiencing their neighborhood as dangerous, young people may become anxious, depressed, defiant, and/or aggressive (Aneshensel & Sucoff, 1996; Gorman-Smith & Tolan, 1998; Greenberg, Lengua, Cole, & Pinderhughes, 1999; Griffin, Scheier, Botvin, Diaz, & Miller, 1999). Children who have seen or been the victim of violence are more likely to perceive themselves as vulnerable to violence and are more likely to report carrying weapons to school (Simon, Dent, & Sussman, 1997; Uehara, Chalmers, Jenkins, & Shakoor, 1996).

A newer line of research has begun to examine how community-level processes and forms of social control may be related to youth delinquency. Studies have shown that the extent of collective social control (e.g., the extent to which members of the community have local friendship networks and share collective willingness to intervene in youth misbehavior, such as skipping school, painting graffiti, showing disrespect to adults) correlates with decreased rates of delinquency and problem behaviors and partially mediates the relationship between community structure variables and delinquency (Bursik & Grasmick, 1993; Elliott et al., 1996; Sampson, 1997; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997).

**Social Environment and Community Influences on Families and Children**

Another strategy for assessing the impact of the broader social environment and community is to examine how these broader contextual factors influence group and individual processes (e.g., family, peer, or child individual characteristics). The basic notion is that structural or demographic variables—such as SES, culture, and community deterioration—probably influence everyday social routines and ways of relating, which may in turn affect the risk of antisocial behavior.

Compared with lower-SES parents, those in middle-class families are more likely to monitor their children’s friendships and less likely to use harsh discipline (Heimer, 1997); both are parenting behaviors shown to be causal risk factors for child externalizing behavior problems (see Family Factors and Processes section). Additional research has documented that higher levels of perceived economic stress are associated with parental distress, which in turn increases parental hostility, decreases parental monitoring, and subsequently increases youth externalizing behavior (Conger et al., 1992). Other research has documented differences between children of middle-SES families and children of lower-SES families; middle-SES children show less physical aggression and more cooperative interactions with peers (Ramsey, 1988).
Schools

Recently, incidents of school violence have drawn people's attention to the nature of schools and the identification of educational policies, educational practices, and student behavior that can contribute to child and youth conduct problems and violence. It is important to note that the majority of youth who receive any help for a mental health problem receive interventions through their school (Burns et al., 1995). However, such services tend to be brief (approximately one visit per quarter for outpatient or three days for inpatient) and are more typical for younger children (Farmer, Stangl, Burns, Costello, & Angold, 1999).

A number of school policies may affect youth conduct. These policies include zero-tolerance practices (the suspension and expulsion of students for problem behaviors), proficiency testing (requiring students to pass standardized exams to qualify for graduation), full inclusion (providing uniform services in the general classroom regardless of the intensity of the problem), and use of the social maladjustment clause of the federal definition of students with serious emotional disturbance, which indicates that students who are socially maladjusted are not eligible for special education services and civil rights protections unless it is determined that they have an emotional disturbance. Little systematic research, however, has examined how these school policies affect youth conduct. Limited research examining the impact of the social maladjustment clause indicates that this policy may be extremely difficult to apply appropriately. Current rating scales for discriminating between social maladjustment and emotional disturbances have been found to be unreliable (Costenbader & Buntaine, 1999). Similarly, research on teacher assessments of those in need of special education services has shown that while students with externalizing behavior problems are deemed troubled, many are not identified for special education services (Farmer, Rodkin, Pearl, & Acker, 1999). However, in another study, boys recommended for special services showed higher rates of conduct disorder than boys who were referred but not recommended (Mattison, Morales, & Bauer, 1992). This unreliability and lack of clear identification can have profound implications under the social maladjustment clause. By not identifying children with externalizing behavior problems as emotionally disturbed, schools are able to suspend and expel these children without invoking any of the civil rights protection practices that are required for students with identified disabilities.

Even when children are identified as emotionally disturbed, the impact of placement into special classrooms is difficult to assess. Placement into special services is governed by legal mandates, and students placed in more restrictive settings are expected to have more intensive needs than those placed in less restrictive settings. Thus, special placements cannot be experimentally manipulated, and studies comparing outcomes of students in different settings must be conducted with nonequivalent groups. Given these limitations, research indicates that interventions designed to decrease disruptive classroom behavior do result in desired outcomes in both special services classrooms and typical classrooms, with children in restricted classrooms more likely to evidence reduction in disruptive behavior than students in regular classrooms (Stage & Quiroz, 1997). Interestingly, interventions designed to prevent school dropout found that correlated reductions in conduct problems in youth ages 9, 10, and 11 also helped to prevent placement in special classrooms, which in turn reduced the risk of dropping out of school (Vitaro, Brendgen, & Tremblay, 1999).

Cumulatively, these results suggest that special classroom placement supplemented with interventions to reduce disruptive behavior may be effective. However, it is not clear whether these effects are similar for children and youth in elementary, middle, and high school or whether
prevention of special classroom placement may be even more effective.

Changing schools frequently is associated with a variety of problems, including lower academic performance, worse behavior in school, lower grade retention, school dropout, and serious disciplinary problems (Rumberger & Larson, 1998; Swanson & Schneider, 1999; Tucker, Marx, & Long, 1998). Based on data collected by the National Educational Longitudinal Survey, changes that occur during the early school years have little impact on child behavior problems. However, school changes during high school were correlated with a moderate increase in behavioral problems (Swanson & Schneider, 1999). The importance of number of school changes may be mediated by family structure. In families with two biological parents, excessive mobility (eight or more moves) correlated with school problems. However, for all other family configurations, any move was associated with problematic youth behavior (Tucker et al., 1998). Also, school changes and dropout were predicted by high rates of absenteeism, misbehavior, and low-educational expectations (Rumberger & Larson, 1998).

Another school variable considered relevant to child conduct is the type of disciplinary practices invoked for misbehavior. Although disciplinary practices are aimed at reducing problem behavior in schools, surprisingly few studies have directly examined the relationships between school discipline and the development and maintenance of externalizing behavior problems. Given the growing trend of adopting zero-tolerance policies, this lack of data is cause for concern. In a survey on school suspension, the majority of middle school and high school students who received suspensions did not consider this form of discipline to be very helpful in solving problems (Costenbader & Markson, 1998). Data on less punitive forms of school discipline also are limited. However, there is some evidence that use of less punitive forms of school discipline in elementary school (e.g., reminders to be safe and respectful) did result in reduced problem behavior (Lewis, Sugai, & Colvin, 1998).

Another school practice that has received attention is tracking (i.e., the arrangement of students in classrooms by levels of ability). Tracking is a complex factor, as it is intertwined with other characteristics of students, families, friends, and schools in ways that seem to solidify differences among students. Students who come from low-SES backgrounds, attend low-SES schools, are members of ethnic-minority groups (Jones, Vanfossen, & Ensminger, 1995), and display behavior problems (Farmer, 1993) are over-represented among low-ability tracks. Being placed in a low-ability track is associated with less effective instruction, more disruptive off-task behavior by students, and lower than expected academic attainment (Gamoran, Nystrand, Berends, & LeFlore, 1995).

Public concerns about class and school size have grown with concerns about violence in the schools and poor pupil performance. Yet educational researchers have had difficulty determining whether reduced class size positively affects student performance and behavior. Part of this difficulty comes from the fact that schools do not randomly assign students to classes (e.g., there is tracking) and that there are state and federal regulations that limit the size of special education classes. However, when special education restrictions are taken into account, smaller class size does correlate with enhanced performance (Akerhelm, 1995). Research on the size of schools has focused on academic outcomes rather than behavioral outcomes (Lee & Smith, 1997; McGiverin, Gilman, & Tillitski, 1989). This research indicates that the most effective high schools serve 600–900 students. Neither small schools (< 300) nor large schools (> 2,100) are associated with strong learning environments. Similarly, the effect of school size is more profound in schools with lower-SES students and in schools with higher concentrations of minority students (Lee & Smith,
Within schools, youth develop social hierarchies and groups that, in some cases, can set the tone for conduct problems and delinquency. Students in high-status cliques can wield considerable social power with peers and classmates. Recent research has shown that aggressive behavior by boys can enhance the likelihood of their obtaining prominent positions in social structures (Xie, Cairns, & Cairns, 1999), particularly when accompanied by high athleticism or above-average academic performance (Rodkin, Farmer, Pearl, & Van Acker, 2000). Additional research, however, is needed to understand how social cliques and hierarchies develop and contribute to student conduct in schools.

Two features of the classroom also have been related to child externalizing behavior problems—the level of classroom disruption/aggression and teacher-student interactions. One study has documented that the overall level of classroom aggression can have significant effects on individual children's risk for aggression over time (Kellam, Ling, Merisca, Brown, & Ialongo, 1998). More aggressive boys who were assigned to first grade classrooms that were high in disruption and aggression were at markedly increased risk for continuing to be aggressive over the next years of elementary school. This was in comparison with aggressive boys who were not placed in aggressive/disruptive classrooms. In addition, recent research on teacher-student interactions indicates that teachers interact differently with students who have externalizing behavior problems. Students with behavior problems receive more teacher reprimands and fewer opportunities to respond appropriately to teacher requests (Van Acker, Grant, & Henry, 1996; Wehby, Dodge, & Valente, 1993). To some extent, lowering teacher-student ratios, particularly in special education classrooms, can mitigate these teacher-student interactions (Thurlow, Ysseldyke, Wotruna, & Algozine, 1993).

Complementing research on the impact of schools on children and youth is research that examines how children and youth feel about their schooling experience. “School bonding” consists of attachment to school, commitment to educational pursuits, and belief in the fairness of school rules. Evidence shows that school bonding is related to delinquency in middle school, with decreased bonding associated with increased rates of delinquency (Jenkins, 1997). Further, interventions designed to modify elementary school teaching practices to increase school bonding showed bonding to be a predictive risk factor for externalizing behavior problems in adolescence. Through an intervention designed to modify teacher behavior, successful changes in school bonding were associated with improved academic achievement (Abbott, O'Donnell, Hawkins, Hill, & Kosterman, 1998). Long-term effects of this intervention program, when combined with parent training and social competence training for the children, showed that the package of interventions provided throughout elementary school had enduring modest effects in reducing self-reported violent behavior, heavy drinking, and sexual intercourse before age 18 among multiethnic urban children (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999).

Implications for Malleable Community Risk Factors and Developmental Processes

Existing research on the broader social environment, communities, and schools indicates that many factors affect the development and likelihood of youth conduct problems. As noted at the beginning of this section, many of the social and community factors that have been associated with youth conduct problems operate in
conjunction. Lower SES, income inequality, and deteriorated housing frequently occur together and, as a cluster, are associated with high rates of crime and delinquency. However, much of this research is correlational and has focused on rates of problem behavior across geographic regions rather than individual variations in conduct. Also, social and community variables are difficult to conceptualize as “malleable” because altering income, housing, and employment opportunities would require major social change and incredible financial resources.

How then do we go about incorporating these relevant variables into developmental models for predicting and intervening with child and youth conduct problems? One strategy frequently employed by researchers is to use SES, income, violent neighborhoods, and so forth as selection criteria for determining high-risk groups and targeting interventions. This way, such social and community factors serve as contextual variables and are conceptualized as factors that potentially moderate the salience of other child, family, and peer risk factors and processes (e.g., parental monitoring, peer deviance). Although a useful strategy (it increases the probability not only that those most in need will be in the intervention but also that it will be possible to detect a change), it does little to help understand how such social and community factors affect conduct problems.

This question of “how” has motivated researchers interested in identifying variables that mediate the association between social and community factors and child/youth conduct problems. To date, two important sets of factors have been identified as mediators—family processes and a community process known as collective social control. Lower-SES families or families experiencing economic distress are more likely to engage in harsh discipline and provide less effective monitoring, which, in turn, partially mediates the effect of these broader variables on youth conduct problems. Similarly, the research on collective social control indicates that it partially mediates the relationship between community disadvantage and rates of delinquency and violent crime. Although research on family processes has shown that parental monitoring and discipline are causal risk factors for child and youth conduct problems, additional research is needed on collective social control to determine its malleability and the resulting impact on youth behavior. Studying the malleability of collective social control is a critical next step that could have profound implications for indicating the causal potential of this variable and developing more effective community-level interventions to prevent youth problem behavior.

Given the number of child, family, and peer processes reviewed in previous sections, it is clear that much more research is needed to examine how correlates, predictive risk factors, and causal risk factors at lower levels of analysis may either mediate or be moderated by broader social factors.

The information reviewed here about school effects on child and youth conduct problems also suggests a range of important factors. School policies, classroom placement, tracking, and classroom size all could affect youth conduct. Although many of these school variables have been related to academic success and failure, surprisingly few studies have examined these issues in relation to child and youth conduct. Those studies that have examined behavioral and conduct-related outcomes suggest that school variables do correlate with problematic behavior. However, more systematic research is needed to establish the strength of these associations and the degree to which school policies and practices predict youth behavior.

Promising research has been conducted on classroom aggression, teacher-student interactions, and school bonding. Each of these school variables has been related to child and youth conduct. In the case of classroom aggression, levels of classroom aggression in first grade reliably predicted increased aggressive behavior in later grades for children who were already showing some problem behavior. Similarly, the research on early school
bonding has shown it to reliably predict decreases in conduct problems in adolescence.

These important results need to be advanced to determine ways to modify early classroom aggression levels, improve school bonding, and evaluate the impact of these changes on child behavior. However, it is equally important that this work be integrated with research reviewed in previous sections—child characteristics, family processes, and peer factors. What are the consequences of altering early classroom aggression on child development of hostile attributions, peer rejection, and bullying? By improving school bonding, is one also influencing parental monitoring of child behavior or structuring of the learning environment? Are school-based interventions more or less effective in different neighborhood and community contexts? Clearly, many important questions remain to be investigated, questions whose answers could have enormous impact on the development of more effective preventive interventions for child and youth conduct problems.

References


### Table 4: Broader Social Environment, Communities, and Schools—Research Summaries

**Broader Social Environment—Culture**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Sample</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hartz</td>
<td>1995</td>
<td>Concurrent group</td>
<td>96</td>
<td>27% Cauc, 8% FilipA, 26% Japa, 16% Polya, 23% Other*</td>
<td>High school students' ratings of parents' aggression during conflict resolution were higher for Polynesian-American than European-, 'Hispanic-', or Japanese-American students. Students' reports of reciprocal aggression were higher for European-American families than Filipino-, Japanese-, or Polynesian-American groups.</td>
</tr>
<tr>
<td>Heimer</td>
<td>1997</td>
<td>Prospective longitudinal 3 yrs</td>
<td>870 11-17 yrs &gt; 13-19 yrs 100% Low-upper N/R% AFA N/R% Cauc N/R% Other</td>
<td>Youth's learning/acceptance of definitions favorable to violence mediated the relationship between SES (occupation, education, &amp; income) &amp; self-reports of violent delinquency, taking into account age, race, neighborhood crime, &amp; peer associations in 1978, violence in 1977 &amp; 1979. Low-SES youth were more likely to endorse attitudes that favored violence. Predictors of definitions/favoring violence included power-ascriptive discipline, urban residence, 1977 aggressive friends, &amp; 1977 violent delinquency.*</td>
<td></td>
</tr>
<tr>
<td>Kumaqi &amp; Strauss</td>
<td>1983</td>
<td>Concurrent correlational</td>
<td>1,165 12th gr 54% Low-upper 33.5% India 54.5% Japan 12% U.S.</td>
<td>According to youth reports, Indian, Japanese, &amp; U.S. parents used reasons as the primary tactic to resolve conflict, followed by verbal aggression, then by violence. Parents' use of violent tactics was reported more frequently by U.S. than by Japanese or Indian students. U.S. students reported similar rates of violence for both parents, while Indian &amp; Japanese students reported lower rates for mothers than fathers. Husbands &amp; wives high in risk tended to have higher rates of conflict tactics.</td>
<td></td>
</tr>
</tbody>
</table>

**Key Statistics**

- **Parent Aggression Toward Teens:**
  - $R^2 = 28$, $F(6, 129) = 8.17$, $p < .0001$
  - $r = .43$, $p < .05$ mothers
  - $F = 4.55$, $p < .05$ Polynesian–U.S. parents
  - $F = 10.45$, $p < .01$ Polynesian x parent (mother)
  - $M's = 49.5$ F, 29.5 E, 12.8 J, 28.9 F father
  - $M's = 129.8$ F, 31.5 E, 11.2 J, 26.0 F mother
  - Year: Aggression Toward Parent.
  - $R^2 = .38$, $F(3, 173) = 35.43$, $p < .0001$
  - $F = 10.57$, $p < .0001$ parent conflict tactics
  - $r = .23$, $p < .0001$ CES x EuroAM
  (means not reported; multiple regressions)

- **Violent Delinquency 1979 $R^2 = .30$**
  - $\beta = .20$, $p < .01$ definitions favor violence 1978
  - $\beta = .32$, $p < .01$ violent delinquency 1978
  - $\beta = .11$, $p < .05$ urban residence
  - $(p's = ns: SES, age, race, noncontact home, neighborhood crime; 1977: parent supervision, discipline, & disapproval of aggression; 1979: aggressive friends)

- **Violent Delinquency Definitions Favoring Violence 1978 $R^2 = .48$**
  - $\beta = .17$, $p < .01$ urban residence
  - $\beta = .31$, $p < .05$ power-ascriptive discipline 1977
  - $\beta = .42$, $p < .01$ aggressive friends 1978
  - $\beta = .35$, $p < .01$ violent delinquency 1978
  (p's = ns: SES, age, race, noncontact home, neighborhood crime; 1977: parent supervision & disapproval of aggression)

(see other Heimer entries for full models)

* Structural equation models

---

**Reasoning**

- $M's = 4.96$, $t = 6.25$, $p < .05$ U.S. husband
- $M's = 5.07$, $t = 6.84$, $p < .05$ U.S. wife
- $r's = .91$, $t = .87$, $p < .05$ U.S. husband-wife

**Verbal Aggression**

- $M's = 2.35$, $t = 5.55$, $p < .05$ U.S. husband
- $M's = 2.35$, $t = 5.55$, $p < .05$ U.S. wife
- $r's = .77$, $t = .83$, $p < .05$ U.S. husband-wife

**Violence**

- $M's = 0.80$, $t = 1.37$, $p < .05$ U.S. husband
- $M's = 0.42$, $t = 0.67$, $p < .05$ U.S. wife
- $r's = .72$, $t = .76$, $p < .05$ U.S. husband-wife

(Statistical analyses on means not conducted)

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* Björregaard & Smith (1993); Edelstein & Huizinga (1993); & Thurnberry et al. (1993): *see "Peer Characteristics, Gangs"*

* > indicates that data at first age are used to predict data at second age.

** Unless otherwise indicated, income is reported in yearly amounts.
Broader Social Environment, Communities, and Schools—Broader Social Environment

Social Structure

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alegria &amp; Gust et al.</td>
<td>1999</td>
<td>Prospective longitudinal 20 yrs</td>
<td>Population: census data from 75 community areas (CAs) with populations over 2,500, Chicago, IL, 1973 &amp; 1990</td>
<td>75</td>
<td>CA</td>
<td>50%</td>
<td>N/R</td>
<td>39% Black 61% Other (communities) 38% Black 62% Other (homicides)</td>
<td>Increase in the homicide rate between 1970 and 1990 for 75 Chicago communities was predicted by 1976 &amp; 1990 unemployment rates for blacks and 1990 unemployment rates for nonblack residents.</td>
</tr>
<tr>
<td>Catalano, Novaco, &amp; McConnell</td>
<td>1997</td>
<td>Concurrent longitudinal 3 yrs</td>
<td>Population: weekly data of public health data on civil commitments, crime to others, claims for unemployment insurance, San Francisco CA</td>
<td>N/R</td>
<td>Adults</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Increases in civil commitments for danger to others increased with usual increases in layoffs as measured by applications for unemployment insurance. Large increases in layoffs, however, were associated with fewer commitments.</td>
</tr>
<tr>
<td>Herman</td>
<td>1997</td>
<td>Prospective longitudinal 3 yrs</td>
<td>Population: national probability sample of U.S. households, 11-17 year-olds, representative on age, sex, race, low income, National Youth Survey</td>
<td>870</td>
<td>11-17 yrs &gt;</td>
<td>100%</td>
<td>Low-upper</td>
<td>N/R</td>
<td>N/R/AF</td>
</tr>
</tbody>
</table>

Key Statistics

Black Homicide Rates, Age-Standardized
Men adj $R^2 = .72, F = 26.36, p < .01$
$\beta = .35, p < .10$ 1970 unemployment
$\beta = .46, p < .05$ 1990 unemployment
Women adj $R^2 = .46, F = 9.55, p < .01$
$\beta = .09, p < .05$ 1970 unemployment
$\beta = .58, p < .01$ 1990 unemployment
(p = ns: 1970 homicide rate)

Nonwhite Homicide Rates, Age-Standardized
Men adj $R^2 = .56, F = 21.94, p < .01$
$\beta = .73, p < .01$ 1990 unemployment
Women adj $R^2 = .17, F = 4.26, p < .01$
$\beta = .49, p < .01$ 1990 unemployment
(p's = ns: 1970 homicide, unemployment rates) (OLS regressions)

Model: Net Effect of Job Loss on Violence—Men
$\eta = -37.3 + .06$ 1973-1982, 50% base, 60% White, 4% Hispanic
Model: Net Effect of Job Loss on Violence—Women
$\eta = -27.9 + .05$ 1973-1982, 20% base, 48% White, 56% Hispanic
(p's < .05, controlled for autocorrelations) (time series models)

$\lambda^2 = 380.83, df = 164, \chi^2 = .54$
Violent delinquency 1977 $R^2 = .58$
$\beta = .11, p < .05$ SES
$\beta = .14, p < .01$ residency
(p's = ns: age, gender, ethnicity, neighborhood crime)
(see other Herman model for full model) (structural equation model)

Average INTERPOL Homicide Rates
$R^2 = .26$
$\beta = .39, p < .05$ dummy econ. discrimination*
(p's = ns: income inequality, % urban, % male 15-29, ethnolinguistic heterogeneity, population density, population under age 15, development index, democracy index)
(Variable from the World Handbook of Political & Social Indicators, 1983) (regression analysis)
Broader Social Environment, Communities, and Schools—Broader Social Environment

Social Structure

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samson</td>
<td>1986</td>
<td>Concurrent/retrospective</td>
<td>Population: random selection of youth from sample stratified by race, sex, official delinquency status, &amp; SES; Seattle Youth Study</td>
<td>1,612</td>
<td>15-18 yrs</td>
<td>75%</td>
<td>Low-upper</td>
<td>31% AHA</td>
<td>69% Cauc</td>
</tr>
</tbody>
</table>

Key Statistics

<table>
<thead>
<tr>
<th>Police Contacts Ever, Male Youth</th>
<th>$R^2 = .27, p &lt; .01$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta = -.05, p &lt; .10$ Individual SES</td>
<td></td>
</tr>
<tr>
<td>$\beta = -.11$ neighborhood SES</td>
<td></td>
</tr>
<tr>
<td>$p's = .27$ serious, 14 family/school delinquency</td>
<td></td>
</tr>
<tr>
<td>$\beta = .14$ delinquent peers</td>
<td></td>
</tr>
<tr>
<td>$\beta = .11$ black</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Police Ever, Female Youth</th>
<th>$R^2 = .21, p &lt; .01$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta = -.15$ neighborhood SES</td>
<td></td>
</tr>
<tr>
<td>$\beta = .25$ black</td>
<td></td>
</tr>
<tr>
<td>$p's = .15$ family/school, .23 drug/alcohol delinquency</td>
<td></td>
</tr>
</tbody>
</table>

Major Court Referrals: $R^2 = .34 m, .32 f, p's < .01$

<table>
<thead>
<tr>
<th>Police Contact Past Year, Male Youth</th>
<th>$\chi^2(1) = 26.4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta = -.55$ neighborhood SES</td>
<td></td>
</tr>
<tr>
<td>$\beta = .20$ serious delinquency</td>
<td></td>
</tr>
<tr>
<td>$\beta = .28$ delinquent peers</td>
<td></td>
</tr>
<tr>
<td>$\beta = .57$ black</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Police Contact Past Year, Female Youth</th>
<th>$\chi^2(1) = 28.2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta = -1.56$ neighborhood SES</td>
<td></td>
</tr>
<tr>
<td>$\beta = .56$ family/school delinquency</td>
<td></td>
</tr>
</tbody>
</table>

(p's < .05 unless noted, for unreported b's, $p = m$; models included family/school, drug/alcohol, & serious delinquency; individual & neighborhood SES, race, broken home, delinquent peers & gang membership) (logistic regressions)

Communities & Neighborhoods—Housing

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Pattern analysis</th>
<th>Population</th>
<th>Size</th>
<th>Location</th>
<th>%</th>
<th>Spatial &amp; temporal analyses of juvenile gun crimes between 1980 &amp; 1990 in Baltimore, MD, found that most incidents clustered in high social stress (HSS) census tracts. Patterns varied by age, race, &amp; location. For example, crimes by black juveniles or black victims clustered in HSS areas, particularly high social stress areas. Criminals or white victims occurred all over, with boundary effects along the edges of HSS areas. Crimes by white juveniles on black &amp; white victims were committed outside of HSS areas. These patterns showed stability over time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamer &amp; Powell</td>
<td>1994</td>
<td>Geocoding &amp; spatial analysis</td>
<td>Census data &amp; police records of juvenile gun crimes, Baltimore, MD, 1980-1990</td>
<td>2,369</td>
<td>Low-upper locations</td>
<td>91.6% AHA</td>
<td>91.6% AHA</td>
</tr>
</tbody>
</table>

Juvenile Gun Crimes & High Social Stress (HSS) Tracts

* Overall
  * Black juvenile offender, black victim
  * Black juvenile offender, black juvenile victim
  * White juvenile offender, black victim
  * White juvenile offender, white victim

Social Stress Index: persons/occupied housing unit, median home value, % female, % black, % under 18 (see study for spatial analyses) (geocoding & spatial analysis)
### Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

**Housing**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith &amp; Jarjoura</td>
<td>1988</td>
<td>Concurrent</td>
<td>random sample of 200 households in 57 neighborhoods (defined by census blocks &amp; police beats) from 3 SMSAs: Tampa-St. Pete, FL; St. Louis, MO; &amp; Rochester, NY, 1977; data aggregated by neighborhood</td>
<td>57</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Violent crime rates (resident reports) were predicted by the interaction of % low income (under $5,000) &amp; residential mobility, % single-parent households, population density, &amp; % ages 12-20 yrs, taking into account % low income, residential mobility (main effects), % nonwhite, % living alone, racial heterogeneity, &amp; location.</td>
</tr>
</tbody>
</table>

**Spelman** 1993 Concurrent group comparisons

<table>
<thead>
<tr>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Residential blocks with unsecured abandoned buildings (entered without force) had higher drug &amp; property crime rates than control blocks or blocks with secured abandoned buildings. Unsecured illegally used abandoned building presence correlated with property &amp; drug crime rates* after controlling for number of vacant buildings, physical condition of block, block location &amp; demographics (race/ethnicity, age, % owned/rented, &amp; % single parents). Building type did not predict rate of violent crime.</td>
</tr>
</tbody>
</table>

**Wallace** 1990 Concurrent correlational data from 2 time periods; T1 not used to predict T2

<table>
<thead>
<tr>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Low birthweight rate (LOB), &amp; an index of poverty &amp; overcrowding accounted for 78% (1970-1973) &amp; 79% (1978-1992) of the variance in number of intentional violent deaths (homicide &amp; suicide).</td>
</tr>
</tbody>
</table>

**Key Statistics**

- **Violent Crime Rates** $R^2 = .63$
  - $\beta = .002, t = 2.70$ mobility × low income
  - $\beta = .07, t = 1.39$ single-parent household
  - $\beta = .52, t = 2.54$ population density
  - $\beta = .06, t = 2.31$ % ages 12-20
  - (p’s = ns: % low income, residential mobility, dty, racial heterogeneity, % nonwhite, % living alone)

- **Crime Rates** Unsecured (n = 16) vs. Other (n = 43)
  - Property crimes/block, Ratio 1.8 $t = 1.99, p < .05$, M’s = 5.31 case, 2.93 dfl
  - Drug crimes/block, Ratio 3.2 $t = 2.47, p < .05$, M’s = 2.59 case, 3.84 dfl

- **Per Block Crime Rates**
  - Property crimes $\Delta R^2 = .07, F(1, 57) = 4.32, p < .05$
  - Drug crimes $\Delta R^2 = .10, F(1, 57) = 5.36, p < .05$
  - (p’s = ns for vacancy status, building condition, block location & demographics, *rates based on calls for police service resulting in an official police report*)

- **Intentional Violent Deaths (IVD) 1970-1973**
  - Adj $R^2 = .78$
  - $\beta = .12, p = .03$ constant
  - $\beta = .02, p = .000$ SES × crowding*
  - $\beta = .02, p = .000$ low birthweight**

- **Intentional Violent Deaths 1978-1982**
  - Adj $R^2 = .79$
  - $\beta = 1.59, p = .003$ constant
  - $\beta = .02, p = .000$ SES × crowding*
  - $\beta = .02, p = .000$ low birthweight**

- *SES (citywide SES rank) × crowding (% with over 1.51 persons/rooms × population/100,000)
- **LOB rates/100: the births × pop/100,000 (MANNCOVA)
### Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

#### Community

**Authors**
Anshenfeld & Sucoff

**Year**
1996

**Design**
Concurrent

**Representativeness**
- Population: 3-stage probability sample of Los Angeles County, CA—census tract, blocks, & households; screened households for 12-17 yr-old permanent residents; Latino youth over-represented, non-Hispanic whites under-represented

**Size**
377

**Age**
12-17 yrs

**% Male**
54%

**SES**
- Low–upper: 40%
- Middle: 30%
- Upper–lower: 30%

**Ethnicity**
- 11% AfAm
- 27% poverty
- 26% Cauc
- 49% HSP
- 4% Other

**Result**
Adolescents who reported more

#### Gorman-Smith & Tolan

**Year**
1998

**Design**
Prospective

**Representativeness**
- Convenience: screened youth from 17 Chicago, IL, public schools in low-SES inner-city neighborhoods; selected youth rated high risk for aggression by teachers, & random sample of remaining students; Chicago Youth Development Study

**Size**
245

**Age**
5th & 7th

**% Male**
100%

**SES**
- Low-middle: 48%<10k
- High-middle: 74%<26k

**Ethnicity**
- N/A

**Result**
Exposure to violence in the past year (68% of students), family structure (mothers & sons' combined ratings of family support, intolerance of antisocial values, & organization), & the interaction of exposure x family structure predicted change in aggression over 1 yr (combined child/parent/teacher ratings), taking into account exposure to other stresses, family beliefs, cohesion, parental monitoring, & discipline.

#### Greenberg, Luegan, et al.

**Year**
1999

**Design**
Prospective

**Representativeness**
- Convenience: selected normative sample of kindergarten students based on gender, race, & teacher-rated behavior problems; high-risk schools in 1) Durham, NC, 2) Nashville, TN, 3) Central PA, 4) Seattle, WA

**Size**
337

**Age**
K > 1st gr

**% Male**
52%

**SES**
- Low-middle: 43%<10K
- High-middle: 53%<26K

**Ethnicity**
- N/A

**Result**
Neighborhood risk (interviewer report of neighborhood environment, & parent report of neighborhood safety) along with SES (parental occupation), maternal depression, & family life stress predicted parent's reports of externalizing behavior problems, later, controlling for family factors (family expressiveness, social support, marital distress, & home environment), maternal age, # of siblings, & status, paternal education, race, & study site. Neighborhood risk, life stress, & less family expressiveness predicted teacher reports of authority acceptance.

### Key Statistics

- **Conduct Disorder:**
  - $\gamma^2 = -0.11$, $F(17, 857) = 0.19$
  - $\beta = 2.13$, $p < 0.05$ poverty–work risk, ambient hazards
  - $\beta = 0.13$, $p < 0.05$ poverty–working-class neighborhood, Lat
  - $\gamma^2 = 0.05$, $F(17, 857) = 2.84$
  - $\beta = 0.22$, $p < 0.05$ percent poverty, ambient hazards
  - $\beta = 0.17$, $p < 0.05$ working-class neighborhood, Af Am
  - $\beta = 0.16$, $p < 0.05$ middle-class neighborhood, Wh & Lat
  - $\gamma^2 = 0.05$, $F(17, 857) = 2.84$
  - $\beta = 0.22$, $p < 0.05$ percent poverty, ambient hazards
  - $\beta = 0.17$, $p < 0.05$ working-class neighborhood, Af Am
  - $\beta = 0.16$, $p < 0.05$ middle-class neighborhood, Wh & Lat

- **Time 2 Aggression:**
  - $\gamma^2 = 0.04$
  - $\beta = 0.18$, $p < 0.01$ aggression Time 1
  - $\beta = 0.26$, $p < 0.01$ exposure to violence
  - $\beta = 0.16$, $p < 0.05$ family structure
  - $\beta = 0.14$, $p < 0.05$ structure x exposure

- **Exposure to Violence, Aggression by Family Structure:**
  - $\gamma^2 = 0.03$, $p < 0.01$ high family; $\beta = 0.13$, $p < 0.05$ low family

- **Externalizing, Parent Report:**
  - $\gamma^2 = 0.03$, $p < 0.05$ SES race; occupation
  - $\beta = 0.24$, $p < 0.05$ family risk; life stress
  - $\beta = 0.25$, $p < 0.05$ mother’s depression
  - $\beta = 0.17$, $p < 0.01$ neighborhood risk

- **Authority Acceptance, Teacher Report:**
  - $\gamma^2 = 0.21$
  - $\beta = 0.11$, $p < 0.05$ family risk; life stress
  - $\beta = 0.13$, $p < 0.01$ family risk; expressiveness
  - $\beta = 0.17$, $p < 0.01$ neighborhood risk

(1) demo: # sis, maternal age, single parent; (2) SES/race; education, occupation; race; (3) family: life stress, family expressiveness, social support, marital distress, home environment; (4) maternal depression, neighborhood, site (see study for nonsignificant $\beta$ % steps in multiple regressions)
Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griffin, Scheur, et al.</td>
<td>1999</td>
<td>Concurrent correlational</td>
<td>452</td>
<td>6th gr</td>
<td>51%</td>
<td>Low-middle</td>
<td>90% AFA</td>
<td>Self-reports of perception of neighborhood risk (gang activity &amp; delinquency, toughness necessary in neighborhood), friends' delinquency, &amp; less parental monitoring were associated with higher interpersonal aggression. Individual differences in risk being partially mediated the relationship between neighborhood risk, friends' delinquency, &amp; aggression, while anger control skills partially mediated the relationship between parental monitoring &amp; aggression.</td>
</tr>
<tr>
<td>Schoen, Dent, &amp; Sussman</td>
<td>1997</td>
<td>Concurrent correlational</td>
<td>504</td>
<td>M = 15.6 yrs</td>
<td>57%</td>
<td>Low-middle</td>
<td>10% AFA</td>
<td>Students' perceived vulnerability to victimization, peer knifing or gun carrying, gang/gangging crew affiliation, &amp; male gender increased the risk of carrying a weapon to school (25% of sample; self-report), accounting for age &amp; type of school attended (traditional or continuation). Ethnicity, parents' education, &amp; living arrangements were not associated with weapon carrying.</td>
</tr>
<tr>
<td>Uehara, Chalmers, et al.</td>
<td>1996</td>
<td>Retrospective correlational</td>
<td>1,035</td>
<td>10-19 yrs</td>
<td>52%</td>
<td>Low</td>
<td>100% AFA</td>
<td>Self-reports of current weapon carrying (33% of sample) were moderately associated with having ever witnessed violence (~49%); been the victim (~49%), or being the perpetrator (~29%) of a violent crime. Male gender, older age, &amp; school attended were also associated with self-reports of lifetime victimization or perpetration of a violent crime; 86% of perpetrators witnessed or were victims of a violent crime.</td>
</tr>
</tbody>
</table>

Key Statistics

| $\chi^2$ (253, N = 452) = 708.9, p < .001, CI = .90 |
| $R^2 = .47$ |
| $\beta = .15, p < .05$ neighborhood risk—aggression |
| $\beta = .28, p < .01$ neighborhood risk—risk taking |
| $\beta = .21, p < .01$ risk taking—aggression |
| $\beta = .39, p < .001$ friends' delinquency—aggression |
| $\beta = .23, p < .01$ friends' delinquency—risk taking |
| $\beta = .21, p < .01$ risk taking—aggression |
| $\beta = .15, p < .05$ parent monitoring—aggression |
| $\beta = .39, p < .001$ parent monitoring—anger control |
| $\beta = .16, p < .01$ anger control skills—aggression (structural equation modeling) |

Adolescent Weapon Carrying

**General perceived vulnerability**
Adj OR = 1.14, 95% CI = 1.06 - 1.22 high

**Perceived vulnerability in school**
Adj OR = 0.93, 95% CI = 0.86 - 1.00 medium

**Perceived vulnerability to/from school**
Adj OR = 0.94, 95% CI = 0.86 - 1.00 high

**Peer weapon carrying**
Adj OR = 2.34, 95% CI = 1.63 - 2.52 yes/no
Adj OR = 2.11, 95% CI = 1.68 - 3.15 gun

**Affiliation with gangs/friends**
Adj OR = 2.57, 95% CI = 1.49 - 4.43 yes (simultaneous logistic regression)
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population:</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burks &amp; Grauman</td>
<td>1993</td>
<td>Concurrent</td>
<td>census data &amp; juvenile court records for 74 neighborhoods, Chicago, IL, 1960 &amp; 1980</td>
<td>74</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>20% AFA &amp; N/R Other M's 1960; 40% AFA &amp; N/R Other M's 1980</td>
<td>Regulatory capacity partially mediated the relationship between economic deprivation &amp; delinquency, rates for 1960 &amp; 1980. Economic deprivation showed direct &amp; indirect effects, while SES showed no effects. Relationship patterns were similar across years, although the % of households with economic deprivation increased from 1960 to 1980. Regulatory capacity: % owner occupied, residential mobility, % net migration, % children w/ parents. Economic deprivation: % families below poverty line, public assistance/120, unemployment rate, % black residents. SES: professional pop, median ed, income</td>
</tr>
<tr>
<td>Elliott, Wilson, et al.</td>
<td>1996</td>
<td>Concurrent</td>
<td>Chicago; identified households with age-eligible youth in 2 census tracts: 1) high poverty: 887 yds, 2) low poverty: 662 yrs</td>
<td>91</td>
<td>10, 12, 14, 16 yrs</td>
<td>N/R</td>
<td>15% AFA, 49% Cau, 21% Hap, 18% Other; Seattle</td>
<td>Informal control (aggregated parent reports of neighborhood bonding, social control, institutional control, &amp; mutual respect) mediated the relationship between neighborhood disadvantage (SES, gender, age, family structure, length of residence) &amp; neighborhood rates of youth problem behavior (delinquency, drug use, &amp; arrests), prosocial behavior, &amp; involvement with conventional friends. Neighborhood variables (informal control, social integration, &amp; informal networks) contributed small but unique effects.</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Denver, CO: stratified multistage probability sample of households with age-eligible youth, census block groups (BGs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(neighboringhood)</td>
<td>(neighborhood)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low-upper</td>
<td>N/R</td>
<td></td>
<td></td>
<td></td>
<td>Youth Prosocial Competence (yrs) = -.39 C neighborhood disadvantage – informal control (yrs) = -.35 D neighborhood disadvantage – informal control (yrs) = -.31 D informal control – prosocial</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Denver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Youth Involvement With Conventional Friends (yrs) = -.39 C neighborhood disadvantage – informal control (yrs) = -.35 D neighborhood disadvantage – informal control (yrs) = -.35 C informal control – conventional friends</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chicago, D = Denver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(p &lt; .05)</td>
<td>(path analysis) Reduction in Variance, Neighborhood Effects 2% C, 1% D problem behavior 5% C, 3% D prosocial 6% C, 2% D conventional friends (Hierarchical linear modeling)</td>
</tr>
</tbody>
</table>
### Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

#### Community-Level Processes & Social Control

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population: sample characteristics</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampson</td>
<td>1997</td>
<td>Concurrent</td>
<td>Neighborhood clusters—combined census tract areas—combined with populations of 6,000; Human Development in Chicago Neighborhoods</td>
<td>3,964</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Collective social control*, structural disadvantage, ethnicity/immigration, lower residential stability, &amp; the lagged crime rate predicted adolescent delinquency, violent victimization, &amp; 1995 homicides. Collective social control mediated the relationship between residential stability &amp; delinquency &amp; partly mediated the relationship between structural disadvantage, ethnicity/immigration, &amp; delinquency. *Collective social control: perceived willingness of neighbors to intervene with juvenile transgressions, graffiti, or disrespect of adults</td>
</tr>
<tr>
<td>Sampson &amp; Groves</td>
<td>1989</td>
<td>Concurrent replication</td>
<td>Nationally representative sample: randomly selected 1 respondent per household from 238 (1982) &amp; 300 (1984) electoral districts, England &amp; Wales; British Crime Survey</td>
<td>21,935</td>
<td>15+ yrs.</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Social disorganization process variables (unsupervised peer groups &amp; density of social transgression network) mediated the relationship between community structural factors (SES, ethnic heterogeneity, residential mobility, urbanization, &amp; family disruption) &amp; self-reported rates of property (burglary &amp; vandalism) &amp; personal (robbery &amp; assault) victimization. Results were replicated 2 years later. For 1982 data, 46% of the effect of SES was mediated by unsupervised peers</td>
</tr>
<tr>
<td>Sampson, Kautz, &amp; Earns</td>
<td>1997</td>
<td>Concurrent replication</td>
<td>Community data &amp; community survey from representative sample of residents in 334 neighborhood clusters (NCS), 847 Chicago census tracts; NCS include 10,800 residents; Project in Human Development in Chicago Neighborhoods</td>
<td>8,782</td>
<td>N/R</td>
<td>N/R</td>
<td>All</td>
<td>N/R</td>
<td>Collective efficacy (neighborhood social cohesion &amp; informal social control) partly mediated the relationship between neighborhood composition (disadvantage, immigrant concentrations, &amp; residential stability) &amp; perceived violence, violent victimization, &amp; 1995 homicides, controlling for average homicide rates from 1995 to 1990. Collective efficacy was the strongest predictor of violence, even when social process covariates (friendship &amp; kinship ties, neighborhood services, &amp; organizational participation) were taken into account</td>
</tr>
</tbody>
</table>

#### Key Statistics

- **Social Disorganization & Collective Social Control**
  - $r^2 = .36$
  - $\beta = -.36$ structural disadvantage
  - $\beta = -.44$ ethnicity/immigration
  - $\beta = -.50$ residential stability
- **Collective Social Control & Delinquency**
  - $r^2 = .75$
  - $\beta = -.18$ collective social control
  - $\beta = .33$ structural disadvantage
  - $\beta = .64$ ethnicity/immigration
  - $p = .05$ lagged crime rate
  - $\beta = .09$ residential stability
- **Social Disorganization & Delinquency**
  - $r^2$ not reported, $b = -.19$ residential stability
  - (weighted least squares regressions; all $p's < .05$)

- **Structure & Unsupervised Peer Groups**
  - $r^2 = .30$ 1982; $r^2 = .12$ 1984
  - $p's = .34$ 1982; .17 1984
  - $\beta = .13$ 1982; .11 $p < .10$ 1984 ethnic heterogeneity
  - $\beta = .12$ 1982; $p < .10$ residential stability
  - $\beta = .23$ 1982; .19 1984 family disruption
  - $\beta = .15$ 1982 urbanization
  - ($p's = ns$: 1984 residential stability, 1984 urbanization)

- **Structure, Social Disorganization, & Delinquency**
  - $r^2 = .21$ 1982; $r^2 = .19$ 1984
  - $p's = .38$ 1982; .35 1984 unsupervised peer
  - $p's = .16$ 1982 & 1984 SES
  - $p's = .15$ 1982; $p = ns$ 1984 residential stability
  - ($p's < .05$ unless noted; models: SES, residential stability, ethnic heterogeneity, family disruption, friend networks, urbanization, unsupervised peers, & in 1982, organizational participation; (WLS regressions)

- **Perceived Neighborhood Violence**
  - $\beta = -.59$, $t = -5.53$ collective efficacy
  - $\beta = .16$, $t = 6.38$ concentrated disadvantage
  - $\beta = -.05$, $t = 3.39$ residential stability
  - ($p's = ns$: immigrant concentration, prior homicide)

- **Collective Efficacy**
  - $\beta = .28$, $t = 13.30$ concentrated disadvantage
  - $\beta = .34$, $t = 2.44$ immigrant concentration
  - $\beta = -.19$, $t = 6.95$ residential stability

- **Violence Scale (All 3 Violence Measures)**
  - $\beta = -.53$, $t = -6.09$ collective efficacy
  - (controls: prior homicide, disadvantage, immigrant residential stability, social process covariates)
  - (see study for victimization & homicide rate analysis)
  - (multiple regression; $b$; other statistics reported)
Broader Social Environment, Communities, and Schools—Social Environmental & Community Influences on Families & Children

Social Status

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conger,</td>
<td>1992</td>
<td>Concurrent correlational</td>
<td>recruited 7th grade students from 34 public &amp; private schools in towns of less than 6,500 in 8 counties, north central Iowa, 1989; only families with 2 parents &amp; a sibling within 4 yrs of age included; area had experienced recent economic decline</td>
<td>205</td>
<td>7th gr</td>
<td>100%</td>
<td>Low-middle</td>
<td>100%</td>
<td>13-yr ed 11% poverty</td>
</tr>
<tr>
<td>Holmer</td>
<td>1997</td>
<td>Prospective longitudinal</td>
<td>national probability sample of U.S. households, 11-17 yr olds, representative on age, sex, race, low attainment; National Youth Survey</td>
<td>870</td>
<td>11-17 yrs</td>
<td>100%</td>
<td>Low-upper</td>
<td>100%</td>
<td>Low-Other</td>
</tr>
</tbody>
</table>

Key Statistics

- Economic Condition, Pressure, & Depressed Mood
  \[ \chi^2(5) = 79.53, p = .004, GFI = .92 \]
  \[ \beta = -.47 \text{ per capita income—family econ pressure} \]
  \[ \beta = .14 \text{ unstable work—family econ pressure} \]
  \[ \beta = -.25 \text{ debt: asset ratio—family econ pressure} \]
  \[ \beta = -.58 \text{ econ pressure—father depressed mood} \]
  \[ \beta = -.68 \text{ econ pressure—mother depressed mood} \]

- Depression Mood, Adjustment Problems Mediated by Marital Conflict & Parenting
  \[ \chi^2(62) = 75.19, p = .11, GFI = .951 \]
  \[ \beta = .48 \text{ mother depression—marital conflict} \]
  \[ \beta = -.31 \text{ marital conflict—mother parenting} \]
  \[ \beta = -.47 \text{ mother depression—mother parenting} \]
  \[ \beta = -.48 \text{ mother parenting—adjustment problems} \]
  \[ \chi^2(62) = 81.67, p = .046, GFI = .945 \]
  \[ \beta = -.42 \text{ father depression—father parenting} \]
  \[ \beta = -.46 \text{ marital conflict—father parenting} \]
  \[ \beta = -.53 \text{ father parenting—adjustment problems} \]

- (series of latent variable structural equation models)

Socioeconomic Status & Parenting 1977

- Parents' power-assusive discipline \[ R^2 = .15 \]
  \[ \beta = -.20, p < .01 \text{ SES} \]
  \[ \beta = -.12, p < .05 \text{ age} \]
  \[ \beta = .15, p < .01 \text{ race, black} \]
  \[ \beta = .12, p < .05 \text{ urban residence} \]
  \[ (\text{SES} = \text{ns, noninact home, neighborhood crime, violent delinquency 1977}) \]

- Parents' supervision \[ R^2 = .07 \]
  \[ \beta = -.11, p < .05 \text{ SES} \]
  \[ \beta = -.10, p < .05 \text{ age} \]
  \[ \beta = -.11, p < .05 \text{ noninact home} \]
  \[ (\text{SES} = \text{ns, race, urban, neighborhood crime, violent delinquency 1977}) \]

- Parents' disapproval of aggression \[ R^2 = .04 \]
  \[ \beta = .13, p < .01 \text{ SES} \]
  \[ (\text{SES} = \text{ns, age, race, urban, noninact home, neighborhood crime, violent delinquency 1977}) \]

- Aggressive Friends 1978 \[ R^2 = .15 \]
  \[ \beta = -.10, p < .05 \text{ age & race, black} \]
  \[ \beta = .31, p < .01 \text{ violent delinquency 1977} \]
  \[ \beta = .11, p < .05 \text{ parents' power-assusive discipline 1977} \]
  \[ \beta = -.13, p < .01 \text{ parents' supervision 1977} \]
  \[ (\text{SES} = \text{ns, SES, urban, noninact home, neighborhood crime, parents' disapproval of aggression 1977}) \]

(see other Holmer entries for full model)

(Structural equation model)
Broader Social Environment, Communities, and Schools—Social Environmental & Community Influences on Families & Children

Social Status

<table>
<thead>
<tr>
<th>Authors</th>
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<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsey</td>
<td>1998</td>
<td>Concurrent</td>
<td>Convenience: recruited children in 3 federally funded &amp; 2 middle-class preschools in medium-size towns; ratio of children to teachers &amp; physical facilities was similar across school types</td>
<td>94</td>
<td>3.2–5.7 yrs</td>
<td>50%</td>
<td>Low-middle</td>
<td>100% Cauc</td>
<td>Low-SES children responded to hypothetical social problem-solving situations with more aggressive solutions than did middle-SES children, who used more reassuring &amp; sharing strategies. Aggression was associated with lower sociometric ratings for middle-SES, but not low-SES children. Low-SES children were rated lower on social competence by teachers than middle-SES children.</td>
</tr>
</tbody>
</table>

Schools—School & Community Services Integration

| Burns, Costello, et al. | 1995 | Concurrent group comparisons | Population: recruited students from public schools in 11 mostly rural counties, western NC; 2-stage sample, children with behavior problems & 10% random sample of remaining students; Great Smoky Mountains Study of Youth | 1,035 | 9, 11, & 13 yrs | 56% | Low-middle | 9% AHA, 34% "poor", 66% "nonpoor" | 16% of a sample of school-age children received services from any service sector (mental health, education, child welfare, juvenile justice, or health) in the past 6 months. 4% were served in the specialty mental health sector. The majority of children were served, & safely served, in the education setting. 40% of children with SED (serious emotional disturbances) (diagnosis & impairment) were served, 22% in the mental health sector. |

Farmer, Stang, et al. | 1998 | Prospective longitudinal | Population: recruited students from public schools in 11 mostly rural counties, western NC; 2-stage sample, children with behavior problems & 10% random sample of remaining students; Great Smoky Mountains Study of Youth | 1,007 | 9, 11, 13 > 10, 12, 14 yrs | 51% | Low-middle | 9% AHA, 27% poverty, 93% Cauc | 21% of students used mental health services over the course of 1 yr, according to parent reports. Services were most likely received in an education setting & with a school counselor. Treated children averaged 3.54 contacts with any service during a 3-mth period. Median by service: 3 (inattentive, 1.5 visits outpatient, & 7 contacts education services). Poverty, younger age, & # of child symptoms predicted service in an education setting, while specialty mental health service was predicted by parent psychiatric problems & # of child symptoms. Intensity of service was predicted by male gender & impact on the family. |

Key Statistics

<table>
<thead>
<tr>
<th>SES &amp; Social Statuses</th>
<th>F (1, 90) = 11.13, p &lt; .001</th>
<th>aggressive</th>
</tr>
</thead>
<tbody>
<tr>
<td>M = .76 low, .16 middle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F (1, 90) = 6.64, p &lt; .05</td>
<td>reassignments</td>
<td></td>
</tr>
<tr>
<td>M = .80 low, .27 middle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F (1, 90) = 4.82, p &lt; .05</td>
<td>sharing</td>
<td></td>
</tr>
<tr>
<td>M = .37 low, .62 middle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SED & Social Competency, Teacher Ratings

| F (1, 90) = 13.09, p < .001 | social problem solving |
| M = .30 low, .36 middle |                            |

(see study for results on empathy & helping)

(2 = 2 HANOVA)
### Broader Social Environment, Communities, and Schools—Schools

#### School Policy

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fosterman &amp; Buntaine</td>
<td>1999</td>
<td>Concurrent comparisons</td>
<td>Source specific: recruited emotionally disturbed (ED) students in special ed facility serving 26 rural school districts, update NY, &amp; socially maladjusted (SM) students (% of internal or external suspensions, but no ED service) from 2 area middle schools</td>
<td>135</td>
<td>12-15 yrs</td>
<td>82%</td>
<td>N/R</td>
<td>25% AHA</td>
<td>Two teacher rating scales were examined for their ability to discriminate between students with social maladjustment &amp; students with emotional disturbance. The DT/CEP Scale correctly identified 21% of the ED students, &amp; incorrectly identified 14% of SM students. In addition, 65% of ED &amp; 61% of SM students had conduct problems. On the ESPS Scale, 2 of 5 subcales showed group differences, with lower scores for ED than SM children. Similarly, discriminant analyses found that 100% of children were classified as ED on 3 of 5 ESPS subcales.</td>
</tr>
<tr>
<td>Farmer, Rodin, et al.</td>
<td>1999</td>
<td>Concurrent conventional</td>
<td>Convenience: recruited students in 59 general ed classes that contained at least 2 students with mild disabilities attending classes 1/2 day or more; included behavioral, learning, MR, speech, &amp; hearing disabilities; schools in suburban &amp; inner-city Chicago, &amp; rural &amp; small-city North Carolina</td>
<td>948</td>
<td>4th-6th gr</td>
<td>48%</td>
<td>N/R</td>
<td>40% AFA</td>
<td>Boys with mild disabilities were over-represented in teacher-rated configurations of low academic, troubled, &amp; extremely troubled boys, &amp; under-represented in the model configuration. Girls with mild disabilities were over-represented in the distressed &amp; very unruly configurations &amp; under-represented in the model, studious, &amp; bright antisocial configurations. Only 25% of boys &amp; 10% of girls in the 4 antisocial configurations were disabled students.</td>
</tr>
<tr>
<td>Mattison, Moratto, &amp; Bauer</td>
<td>1992</td>
<td>Concurrent conventional</td>
<td>Source specific: consecutive referrals from school personnel for SED placement evaluations, 1982-1987; students had no prior seriously emotionally disturbed (SED) residential placements; seminatural central PA</td>
<td>170</td>
<td>6-11 yrs</td>
<td>100%</td>
<td>Low</td>
<td>89% Cauq</td>
<td>Boys referred &amp; recommended for SED (seriously emotionally disturbed) placement had higher rates of conduct disorder, lower adaptive functioning, &amp; more prior therapy, &amp; had families with lower SES, more marital disruption, greater history of psychiatric illness, more physical abuse, &amp; more stressors compared to nonreferred boys. IQ &amp; h/s of educational interventions showed no differences. The strongest predictor of SED placement was CD/ODD diagnosis followed by hx of tr, SES, &amp; physical abuse, controlling for broken home &amp; parental psychiatric illness.</td>
</tr>
</tbody>
</table>

#### Key Statistics

- **DT/CEP Scale**
  - Emotional disturbance: 14% SM, 21% ED
  - Conduct Problems: 61% SM, 65% ED
  - Discriminant analysis: 11% SM, 89% ED

- **ESPS Scale**
  - Interpersonal relations: 44% SM, 65% ED
  - Discriminant analysis: 13% SM, 87% ED

- **Boys** ($6, N = 452) = 52.2, $p < .0001
  - Low academic: $\chi^2 = 2.97, p = .08$
  - Troubled: $\chi^2 = 9.93, p = .002$ 19% disabled, 6% not
  - Extremely troubled: $\chi^2 = 32.6, p < .0001$
  - Antisocial: $\chi^2 = 24.4, p < .0001$ 8% disabled, 30% not
  - Distressed: $\chi^2 = 9.57, p < .002$
  - Very unruly: $\chi^2 = 13.60, p < .002$
  - 31% disability, 8% no disability (df-square)

- **Psychiatric Characteristics**
  - 32% SED, 10% non-SED, $p = .005$ CD/ODD
  - 37% SED, 17% non-SED, $p = .01$ therapy
  - 5.28 SED, 4.60 non-SED, $p < .001$ functioning

- **Family Characteristics**
  - 5.00 SED, 4.90 non-SED, $p = .05$ SES*
  - 71% SED, 53% non-SED, $p = .01$ broken home
  - 86% SED, 72% non-SED, $p < .001$ par psych hx
  - 61% SED, 41% non-SED, $p = .05$ abuse
  - 2.40 SED, 1.80 non-SED, $p < .05$ stressors

* High scores = lower functioning, lower SES
Broader Social Environment, Communities, and Schools—Schools Classroom Placement

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design/Method</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitano,</td>
<td>1999</td>
<td>Intervention</td>
<td>149</td>
<td>6-17 yrs</td>
<td>100%</td>
<td>100% Cau</td>
<td>parent ed</td>
<td>Participation in a dropout prevention intervention program (social skills training for boys &amp; parent training) predicted lower average disruptiveness from ages 9 to 11, controlling for age 6 disruptive behavior, family configuration, IQ, &amp; parent education. Post-intervention disruptiveness mediated the relationship between program participation &amp; non-age-appropriate regular classroom placements (non-AARC, retention, &amp; special ed class). Lower disruptiveness was associated with fewer non-AARC placements. In turn, non-AARC placements at age 12 mediated the effect of the IV program on school dropout. In both analyses, family configuration, parent education, &amp; children's IQ were significant predictors; age 6 disruptive behavior was not. The risk of dropping out of school was 4.5 times higher for retained &amp; 4.75 times higher for combined retained/special classroom students.</td>
</tr>
<tr>
<td>Breidenen,</td>
<td></td>
<td>random</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tremblay</td>
<td></td>
<td>assignment</td>
<td></td>
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</tr>
</tbody>
</table>

Key Statistics

- Mean Effect Size (d焦急) = .78, 95% CI = .58, N = 223
- Effect Size by Setting, Teacher Ratings, & Observed
  - F(22, 220) = 7.62, 95% CI = .59, p < .001, t = -5.39, p < .05
  - ES = .63 regular
  - ES = .86 resource norm
  - ES = .97 self-contained
- Effect Size by Setting, Behavioral Observation
  - F(2, 177) = 0.12, 95% CI = .05, t = -1.10, p < .05
  - ES = .12 regular
  - ES = .27 self-contained
- Effect Size by Instrument
  - F(1, 221) = 1.22, 95% CI = .001
  - ES = .37 teacher rating
  - ES = .83 behavioral observation

Post-intervention Disruptiveness

- r² = .07, p < .05
- β = .30, p < .05 age 6 disruptiveness
- β = .16, p < .10 program participation
- p < .05, MP = 8.74, IV, 10.72 df

(p's = ns: family configuration, IQ, parent ed)

Post-IV Disruptiveness Mediating IV & Non-AARC

- Step 1: $\Delta \beta^2 = 0.92, p = .001$
- Step 2: $\Delta \beta^2 = 3.15, p < .01$
- OR = 0.44, p < .10 program participation
- Step 3: $\Delta \beta^2 = 9.54, p < .01$
- OR = 0.54, p = ns program participation
- OR = 1.13, p < .01 post-IV disruption

Non-AARC Mediating IV & Dropout

- Step 1: $\Delta \beta^2 = 24.56, p < .05$
- Step 2: $\Delta \beta^2 = 1.89, p = ns$
- OR = 0.53, p < .05 program participation
- Step 3: $\Delta \beta^2 = 1.72, p = ns$

(p's = ns: program participation, post-IV disruption)

Post-IV Disruptiveness Mediating IV & Non-AARC

- Step 4: $\Delta \beta^2 = 5.39, p < .05$
- OR = 4.75, p < .05 non-AARC

(p's = ns: program participation, post-IV disruption)

(*p's = 0.05: family configuration, IQ, parent education, p = ns: age 6 disruptiveness)

(hierarchical logistic regression)
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rumberger &amp; Larson</td>
<td>1990</td>
<td>Prospective</td>
<td>Students from public &amp; private schools; National Education Longitudinal Study; NELS:88</td>
<td>11,671</td>
<td>50%</td>
<td>N/R</td>
<td>N/R % AAPI</td>
<td>The relative odds of changing schools or dropping out of school between 8th &amp; 12th grades were higher for students who had moved between 8th &amp; 12th grades &amp; who had low school engagement in 8th grade (absenteeism, misbehavior, low educational attainment), controlling for student, family, &amp; school characteristics.*</td>
</tr>
<tr>
<td>Swanson &amp; Schneider</td>
<td>1999</td>
<td>Prospective</td>
<td>Students from public &amp; private schools; 1998-1999; National Education Longitudinal Study</td>
<td>9,976</td>
<td>50%</td>
<td>N/R</td>
<td>N/R % AAPI</td>
<td>Late school changing (changing schools but not residences, 10th-12th grade) was associated with greater increases in behavioral problems &amp; lower grades in math achievement. In contrast, early moving (change of residence, not schools, grades 8-10) &amp; early changing had no effect on behavioral problems &amp; was associated with increased math achievement from pre-4th to 12th. Students with histories of early moving, changing, or leaving (moving &amp; changing schools) were at increased risk for early dropout. Early or late moving increased the risk of late dropout. Students who experienced early changing or leaving, however, had a decreased risk of late dropout. Early &amp; late high school dropout were also predicted by the total number of times a student had changed schools prior to 8th grade. All analyses controlled for prior math scores &amp; behavioral status, mobility, gender, race, family background,* &amp; educational history.</td>
</tr>
</tbody>
</table>

**Key Statistics**

**Change Schools 8th-12th Grade**
- OR = 1.29 high absenteeism
- OR = 1.27 misbehavior
- OR = 2.18 move
- OR = 0.78 grades
- OR = 0.51 preparation for class
- OR = 1.79, p < .05 low educational expectations
- OR = 0.65 grades

**School Dropout, 8th-12th Grade**
- OR = 4.53 move
- OR = 2.53 high absenteeism
- OR = 1.30 misbehavior
- OR = 1.75 low educational expectations
- OR = 0.65 grades

*(p < .05: female, Hispanic, school change/held back by grade 9, SES, stepfamily, urban, discipline, test scores) (all p’s < .01 unless noted (logistic regressions))
### Broader Social Environment, Communities, and Schools—Schools

**Student Mobility**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucker, Marx, &amp; Long</td>
<td>1998</td>
<td>Concurrent retrospective correlational</td>
<td>cc: school life et: mobility</td>
<td>data from the National Health Interview Survey children's supplement, 1988; multistage probability cluster sampling; 4.5% of 17,000 sampled were ages 7-12, AFA or Cauc, &amp; enrolled in elementary school; children with missing data excluded</td>
<td>4,178</td>
<td>7-12 yrs</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R AFA N/R Cauc</td>
<td>For students living with 2 biological parents, residential mobility did not predict caregiver reports of school problems (academic or behavioral), expect for home mobility, those who had moved 8 or more times by elementary school. For children in any other family structure, any move (1, 2-3, 4-5, 6-7, 8+) was associated with increased likelihood of academic or behavioral school problems. Analyses controlled for age, gender, race, mother's education, family income, # of siblings, recency &amp; distance of last move, family type, &amp; number of moves.</td>
</tr>
</tbody>
</table>

#### School Discipline

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representativeness</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costenbader &amp; Markson</td>
<td>1998</td>
<td>Concurrent group comparisons</td>
<td>Convenience: recruited middle &amp; high school students from 4 schools in 2 inner-city (33%) &amp; small rural town (67%) school districts</td>
<td>209</td>
<td>7th-10th gr</td>
<td>48%</td>
<td>N/R</td>
<td>N/R AFA N/R Cauc</td>
<td>One-third of the middle &amp; high school students surveyed about their experiences with internal &amp; external school suspensions reported that being suspended was &quot;not at all helpful&quot; for solving their problems &amp; that they probably would be suspended again. 39% of these students reported suspension helped &quot;a little,&quot; 12% &quot;a lot,&quot; &amp; 19% endorsed the item &quot;I learned a lesson &amp; I will never be suspended again.&quot;</td>
<td></td>
</tr>
</tbody>
</table>

#### Lewis, Sugai, & Calvin

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
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<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1998</td>
<td>Intervention nonrandom school based</td>
<td>Convenience: recruited all 1st-5th grade students in a small suburban elementary school; school &quot;at risk&quot; large percentage of students received financial assistance or special services</td>
<td>110</td>
<td>1st-5th gr</td>
<td>51%</td>
<td>Low</td>
<td>N/R AFA N/R Cauc N/R Hip &quot;primarily white&quot;</td>
<td>A school-based proactive intervention designed to reduce problem behavior through social skill instruction &amp; direct intervention demonstrated modest sustainable reductions in the overall level of problem behavior during recess, during transitions, &amp; in the cafeteria. Examples of rules &amp; positive behaviors included Be Safe (walk, keep food on tray) Be Respectful (follow adult directions, use polite language). Group contingencies were used for success &amp; the cafeteria, pre-correction &amp; active supervision during transitions. Changes were maintained 1-3 months post-treat.</td>
<td></td>
</tr>
</tbody>
</table>

#### Key Statistics

**Structural Variables & Times Moved, by Family Type, Academic or Behavioral School Problems**

χ² = not reported

- Both biological parents
  - β = .34, p < .05, OR = 2.28 8+ moves
  - All other family types
    - β = .21, p < .001, OR = 2.65 1 move
    - β = .18, p < .001, OR = 2.84 2-3 moves
    - β = .20, p < .001, OR = 2.39 4-5 moves
    - β = .24, p < .001, OR = 2.38 6-7 moves
    - β = .27, p < .01, OR = 2.24 8+ moves

(p' = ns: # sis, recency & distance of last move; family type & moves: 2 bio parents & 0, 1, 2-3, 4-5, & 6-7 moves; other family types & 0 moves; multiple logistic regressions)

**Internal (Int.), External (ext.) Suspension Helpful**

- 31% Int., 33% ext. not at all
- 45% Int., 31% ext. a little
- 13% Int., 11% ext. a lot
- 12% Int., 25% ext learned something

χ²(3, n = 209) = 7.46, p = .03 suspension type
χ²(3, n = 209) = 2.05, p = .16 gender
χ²(3, n = 209) = 9.53, p = .01 inner/outer city (chi-square)

**Average Rate of Problem Behavior per Minute**

- Cafeteria
  - 3.40 baseline (BL)
  - 4.17 social skill training (SS)
  - 2.15 direct intervention (DI)
- Recess
  - 1.57 followup (FU)
  - PMD: 50% DI, 83% FU (3 mths)
- Transition
  - 6.08 BL, 5.74 SS, 3.82 DI, 2.5 FU (1 mth)
  - PMD: 20% 1st half, 60% 2nd half* DI, 100 FU
  - *2nd half: followed a change in strategy (no other statistics reported)
<table>
<thead>
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<th>Age</th>
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<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
</table>
| Farmer           | 1993 | Prospective longitudinal 16 yrs | Population: located children in the National Child Development Study (NCDS), which included “nearly all children” born in Great Britain the 1st week of March, 1958. | 2,996 | 7 > 11, 16, 23 yrs | 100% | N/R | N/R       | Boys in the top 10% for parent or teacher ratings of externalizing were more likely to be in low-ability tracks & less likely to be high-ability tracks, taking into account academic ability, parents’ interest in education, family background & difficulties, and receipt of special education. | Track Placement, Extremizing  
  p < .0001  
  M’s = .22 ext, .47 nonext. high-ability group  
  M’s = .40 ext, .18 nonext. low-ability group  
  (model included academic ability, family background & difficulties, parent interest in ed, special ed)  
  (no other statistics reported, OLS regressions) |
| Cameron, Nystand, et al. | 1995 | Concurrent longitudinal data collected over 1 yr; T1 not used to predict T2 | Conveniences: recruited students from 92 honors, regular, remedial English classes in 10 junior high schools & 8 high schools in 7 Midwestern communities | 1,564 | 8th–11th gr | 50% | Low-upper middle | Classroom observations of remedial English literature students found more off-task behavior & lower engagement (% of reading & writing completed) than in regular or honors classes. Remedial classes had lower achievement than regular or honors classes, controlling for prior reading & writing scores, ability, SES, gender, & minority status. | Class Level Off-Task Classroom Behavior  
  M’s = 2.04 honors, 4.08 regular, 6.84 remedial  
  Class Level % Reading Completed  
  M’s = 87.8 honors, 82.0 regular, 80.4 remedial  
  Class Level % Writing Completed  
  M’s = 91.3 honors, 84.7 regular, 82.6 remedial  
  (F values not reported, all p’s < .05)  
  Achievement  
  \( z^2 = 55.89^* \text{ vs. } 66.32^{**} = 10.73, \ p < .01 \)  
  intercepts = -1.71 non, -2.55 reg, -3.70 remedial  
  *background effects constrained to be equal across class, sex, minority, SES, fall reading & writing scores, ability  
  **Intercepts constrained to be equal (structural equation models) |
| Jones, VanTosan, & Ensinger | 1995 | Concurrent longitudinal data set | Convenience: from High School & Beyond data set, a 2-stage probability sample from 1,100 high schools; oversampled for race & private/Catholic school, random sample of 36 students per school | N/R | 10th gr | N/R | N/R | N/R | The likelihood of being in the academic versus general track decreased for students who came from low-SES families or low-SES neighborhoods; who were Hispanic, male or nonblack; or who had lower grades, ability, or educational aspirations. | Predictors of Academic vs. General Track  
  \( \beta = .30, OR = 1.34 \text{ individual SES} \)  
  \( \beta = .12, OR = 1.12 \text{ school SES} \)  
  \( \beta = -.04, OR = .96 \text{ Hispanic} \)  
  \( \beta = .05, OR = 1.05 \text{ ability} \)  
  \( \beta = -.40, OR = 1.50 \text{ educational aspirations} \)  
  \( \beta = -.22, OR = 1.24 \text{ grades} \)  
  \( \beta = .15, OR = 2.10 \text{ Black} \)  
  \( \beta = .007, OR = 10.20 \text{ female} \)  
  (p’s < .001)  
  (model included school fixed ratio, inclusiveness, & individual x organizational interactions)  
  (multinomial logistic regression) |
### Broader Social Environment, Communities, and Schools—Schools Class & School Size

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Representation</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>50% Approx</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biddle et al.</td>
<td>1998</td>
<td>Cross-sectional</td>
<td>Nationally representative sample of students</td>
<td>4,973</td>
<td>8th</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>LTR</td>
<td>Larger class size was associated with higher achievement scores in math &amp; English, taking into account teacher, family, &amp; community variables, but not ability. However, smaller classes had more low-ability students. When ability was taken into account, smaller class size was associated with higher history &amp; science scores. Class size had a smaller effect than most family, teacher, or community variables, including parents' education. Decreases in class size contributed to small increases in test scores.</td>
</tr>
<tr>
<td>Lee &amp; Smith</td>
<td>1997</td>
<td>Prospective</td>
<td>nationally representative sample of students</td>
<td>9,812</td>
<td>8th</td>
<td>12th gr</td>
<td>N/R</td>
<td>N/R</td>
<td>Low-upper</td>
<td>Gains in math &amp; reading achievement between 8th &amp; 12th grades were highest for schools with moderate enrollment (600-900). Small schools (&lt; 300) showed fewer gains, while very large schools (&gt; 2,100) showed even fewer. School size had a greater effect on schools with lower SES &amp; &gt; 40% minority enrollment. Differences in math gains between low-SES schools &amp; high-SES schools were greater in small &amp; large than in moderate-size schools. Differences in math &amp; reading gains between schools with low &amp; high minority enrollment were greater in large (&gt; 1,000—math; &gt; 1,500—reading) schools.</td>
</tr>
<tr>
<td>McGheen, Gilman, &amp; Tillesi</td>
<td>1989</td>
<td>Meta-analysis</td>
<td>Conveniences: schools in randomly selected school districts, N, IV led to reduced class size for 6 of 9 schools</td>
<td>24</td>
<td>1st-2nd gr</td>
<td>N/R</td>
<td>Low-middle</td>
<td>N/R</td>
<td>Other</td>
<td>Academic achievement (reading, math, &amp; composite scores) were higher in classes that experienced the PRIME TIME intervention to reduce class size, than in classes that had not been reduced.</td>
</tr>
</tbody>
</table>

### Key Statistics

- Achievement Scores
  - Math: $F = 7.45, r^2 = 0.18 (n = 4,973)$
  - $\beta = .12, r = .625, p < .05, M = 0.24$ (class size)
  - $F = 71, r^2 = .17 (n = 9,873)$
  - $\beta = .28, t = 7.71, p < .05, M = 24.3$ (class size)
  - $\delta = 0.03, t = 1.91, p < .10 (n = 4,850)$
  - $p = r$ (n sc

- Low Ability & Class Size
  - Math: $t = 13.20, M = 24.8$ (n = 2164, low 214 class size)
  - $p < .05$ (English, science, history)

- Achievement Scores, Endogeneity of Class Size
  - Science: $F = 10, r^2 = .13$
  - $\beta = -0.08, t = -5.40$ (class size)
  - $p = 1.23, t = 9.00$ (parent education)
  - $p < .05$ (history; $p = r$ (n sc

- Change in Class Size, Change in Scores
  - $M = 25$ to $M = 15, r = 8$ science, $r = 7$ history
  - (OLS regression, 2.5.5 regressions)

- Gains, Math & Reading Achievement, 8th-12th
  - $y = -9.33, r = .53, p < .05$ (read = 300)
  - $y = -1.5, r = .64, p < .05$ (read = 600-900)
  - $y = -1.8, r = .91, p < .05$ (read > 2,100)
  - $y = r$ (slope SES & gains)

- SES & School Size, Difference in Gains
  - 2.6 pts difference high to low SES: 600-900
  - 3.5 pts difference high to low SES: 300
  - 5.0 pts difference high to low SES: 2,100

- Minority Enrollment (> 40%) & School Size, Gains
  - Math (40 Items)
  - Reading (21 Items)
  - 1.0 pt 600-1,200
  - 2.5 pts 3,000-2,100
  - 3.5 pts > 3,000
  - 1.0 pt < 600, > 2,100

- Linear Modeling

- Class Size Reduced ($M = 19.1$ students/class)
  - $\chi^2 = 190.45, d = 40, p < .001$
  - $d = 1.5, 95\% CI = .99-.95$

- Class Size Not Reduced ($M = 20.4$ students/class)
  - $\chi^2 = 6.75, d = 40, p < .05 d = 1.5$
  - (Poisson inverse $\chi^2$)
Broader Social Environment, Communities, and Schools—Schools
School Social Dynamic

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Concurrent</th>
<th>Representativeness</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
</table>
| Ruddin, Partner, et al. | 2000 | Concurrent | 52 | 4th-6th gr | 100% | N/R | 40% AHA | 54% Cauca | 6% Hip | Teacher ratings of interpersonal competence yielded configurations of popular (Toughs) & unpopular (Bright AntiSocial, Troubled) aggressive boys. Configurations of nonaggressive boys included Model (popular-ormoral), Low Academic, & Passive (average popular).

Tough & Model boys received the highest peer nominations for "cool" & "athletic". Tough & Troubled boys had the highest scores on antisocial behavior, & Tough boys had the highest self-ratings of popularity. Tough & Model boys were more often nuclear or central members of social networks, while Troubled boys were more often found in less central roles (isolated or peripheral). |

<table>
<thead>
<tr>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configural Analysis from Teacher Ratings</td>
</tr>
<tr>
<td>Tough: 1.3 agg, 0.46 pop, 0.31 phys, 0.62 aff (+)</td>
</tr>
<tr>
<td>0.38 acad, 0.27 internal, 0.85 shy (-)</td>
</tr>
<tr>
<td>Bright A: 0.64 agg, 0.39 acad, 0.34 int (+)</td>
</tr>
<tr>
<td>0.80 pop, 0.66 phys, 0.64 aff, 0.21 shy (-)</td>
</tr>
<tr>
<td>Troubled: 1.04 agg, 0.62 int, 0.12 shy (+)</td>
</tr>
<tr>
<td>0.98 pop, 0.78 phy, 1.14 aff, 1.35 acad (-)</td>
</tr>
</tbody>
</table>

Peer Ratings: Willers A = .45
Approx F (25, 1853) = 11.1, p < .001
Cool: +.46 Tough, +.26 Model (+16 to −.28 rest)
Athl: +.47 Tough, +.28 Model (+.06 to −.32 rest)
Self Ratings: Willers A = .70
Approx F (35, 1824) = 4.64, p < .001
Pop: +.44 Tough (+.07 to −.19 rest)
(MANOVA, univariate F's not reported, p's < .05)

Configurations & Centrality
χ²(15, N = 452) = 31.6, p < .01
Nuclear: 64% tough, 62% model, 51% bline
Isolated: 15% troubled, 6.2% baseline
Peripheral: 13% troubled, 7.7% baseline
(Log linear analysis)

Xie, Cairns, & Cairns | 1999 | Concurrent | 506 | 4th-7th gr | 10-16 yrs | 42% | 1/3 of families in school district below poverty line | Boys & girls affiliated with social networks having similar configurations of teacher-rated interpersonal competence factors: aggression, popularity, affiliation, physical competence, & academic competence. Individuals in the risk configuration (high on aggression & low on academic competence, physical competence, popularity, & affiliation) were more likely to affiliate with a social network of at-risk peers. In addition, boys who were nominated by peers as highly central to their social networks were rated by teachers as more aggressive than boys with median or low centrality. For girls, greater social network centrality was related to higher teacher ratings of popularity, not aggression. |

<table>
<thead>
<tr>
<th>Individual Configurations</th>
</tr>
</thead>
<tbody>
<tr>
<td>35% high competence: low agg, high rest</td>
</tr>
<tr>
<td>40% average competence: median all</td>
</tr>
<tr>
<td>25% risk: high agg, low rest of factors</td>
</tr>
</tbody>
</table>

Social Network Configurations
Average scores of peers in group
36% high competence: low agg, high rest
45% average competence: median all
19% risk: high agg, low rest of factors

Individual Configurations & Social Networks
Mantel-Haenszel χ²'s not reported, p's < .05
proportions for gr 4 & 5 girls shown in figure
but not reported in text; four analyses conducted: boys, girls, 4th & 5th gr, 6th & 7th gr

Aggression & Social Network Status, Boys
F (2, 209) = 5.14, p < .01
M_S = 4.43 high central, 3.35 med, 2.27 low

Popularity & Social Network Status, Girls
F (2, 277) = 11.00, p < .001
M_S = 5.12 high central, 4.72 med, 4.21 low

(ANOVA, post hoc tests)
Broader Social Environment, Communities, and Schools—Schools

Teacher-Student Interactions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Population</th>
<th>Size</th>
<th>Age</th>
<th>% Male</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
<th>Key Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thunkow, Youd, &amp; et al.</td>
<td>1993</td>
<td>Concurrent</td>
<td>longitudinal</td>
<td>139</td>
<td>1st-6th</td>
<td>66%</td>
<td>N/R</td>
<td>N/R</td>
<td>Qualitative &amp; quantitative aspects of instruction in special education classrooms showed improvements with smaller student-teacher ratios.</td>
<td>Boys' 1st-grade classroom aggression, classroom poverty. &amp; the interaction of 1st-grade individual &amp; classroom aggression predicted teacher ratings of highly aggressive behavior in 6th grade. Highly aggressive 1st-grade boys in high-aggression classrooms were 2.7 times more likely to be rated as highly aggressive in 6th grade than highly aggressive boys in 1st-grade classrooms low in aggression. For girls, 6th-grade aggression was predicted by individual aggression &amp; classroom poverty in 1st grade, but not by classroom aggression.</td>
</tr>
<tr>
<td>Van Acker, Grant, &amp; Henry</td>
<td>1996</td>
<td>Concurrent</td>
<td>comparisons</td>
<td>206</td>
<td>2nd, 3rd, 4th</td>
<td>59%</td>
<td>N/R</td>
<td>N/R</td>
<td>Teachers gave more reprimands, fewer opportunities to respond academically, &amp; more behavioral requests to students at high risk for aggression than mid-risk students.</td>
<td>Boys’ 1st-grade classroom aggression (n = 202) OR = 1.30, CI = 0.85 - 1.98, p = ns individual aggression OR = 0.07, CI = 0.01 - 0.61 classroom aggression OR = 2.27, CI = 1.08 - 4.77 in x classroom aggression OR = 1.07, CI = 1.32 - 6.47, p &lt; .05 classroom poverty Hi-Aggression vs. Low-Aggression Classrooms OR = 1.7 - 5.87 vs. OR = 1.1 - 2.7 Girls' 1st Grade on 6th Grade Aggression (n = 201) OR = 1.75, CI = 1.00 - 2.97 individual aggression OR = 10.83, CI = 1.36 - 86.15 classroom poverty (p &lt; .05 unless noted) Classroom aggression: Mean aggression score of children in classroom (teacher-rated). Classroom poverty: % of students in the classroom who receive a free lunch (hierarchical linear regressions)</td>
</tr>
<tr>
<td>Wehby, Dodge, &amp; Valente</td>
<td>1993</td>
<td>Prospective</td>
<td>longitudinal</td>
<td>82</td>
<td>K &gt; 1st</td>
<td>57%</td>
<td>N/R</td>
<td>N/R</td>
<td>Children identified in kindergarten at high risk for developing conduct problems were given more negative commands in structured &amp; unstructured settings by their 1st-grade teachers than low-risk students.</td>
<td>Test Relevance: Students above median for risk of aggression, 2 inner-city &amp; 2 metro area Midwest schools; Metropolitan Area Children Study control schools Mean Rate per Minute, Teacher Behavior Teacher reprimands p &lt; .01 M = .097 mid-risk, .074 high-risk Opportunities to respond academically p &lt; .05 M = .025 mid-risk, .019 high-risk Behavioral requests p &lt; .01 M = .058 mid-risk, .074 high-risk (t tests, Bonferroni correction) Teacher negative commands, structured activity F = 2.07, p &lt; .05, M = .666 high, .033 low Teacher negative commands, unstructured activity t = 2.30, p &lt; .05, M = .047 high, .025 low (MANOVA, planned contrasts, t-tests)</td>
</tr>
</tbody>
</table>
Broader Social Environment, Communities, and Schools—Schools
School Bonding & Attachment

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Design</th>
<th>Intervention</th>
<th>Sample Size</th>
<th>Age</th>
<th>SES</th>
<th>Ethnicity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott, O’Donnell, et al.</td>
<td>1998</td>
<td>Intervention</td>
<td>nonrandom</td>
<td>808</td>
<td>8th gr</td>
<td>Low-middle</td>
<td>51% Male</td>
<td>24% AFA, 46% Cau, 21% Asa, 9% Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Convenience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Greater implementation of targeted teaching strategies, classroom management, interactive teaching, cooperative learning resulted in greater student-reported bonding to school, involvement in the classroom, &amp; opportunity for reinforcement of classroom involvement.</td>
</tr>
<tr>
<td>Hawkins, Catalano, et al.</td>
<td>1999</td>
<td>Intervention</td>
<td>nonrandom</td>
<td>598</td>
<td>10th gr</td>
<td>Low-middle</td>
<td>50% Male</td>
<td>26% AFA, 22% Asa, 44% Cau, 5% Nca, 3% Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Convenience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High school seniors in preventative intervention classrooms during 1st-4th grades reported more commitment &amp; attachment to school-less school misbehavior, quitting drinking, repeating a grade, &amp;less lifetime violence, sexual activity, or pregnancy than students in control classrooms. Poverty initiated with intervention status. School enrollment was higher for poor IV students than poor controls, fewer poor IV than controls repeated a grade, &amp; fewer working-middle-class IV students went/plag a woman pregnant than controls. The late IV (5th &amp; 6th grade only) showed no treatment effects.</td>
</tr>
<tr>
<td>Jerkies</td>
<td>1997</td>
<td>Concurrent</td>
<td>correlational</td>
<td>754</td>
<td>11-13 yrs</td>
<td>Low-middle</td>
<td>50% Male</td>
<td>22% AFA, 66% Cau, 3% Asa, 5% Hsp, 4% Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Convenience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Components of the school social bond predicted self-reported school delinquency. Educational commitment &amp; belief in school rules directly predicted school crime (drug use/vandalism); school misconduct (cheating, talking in class) &amp; school nonattendance (cutting or tardiness, class or school); Attachment to school directly predicted misconduct &amp; nonattendance. Involvement in school activities was an indirect predictor of school delinquency, through the school social bond.</td>
</tr>
</tbody>
</table>

Key Statistics

- Academic Achievement—CAT: $\chi^2 = 63.3$ (df = 36), $p = .004$, $\gamma = .26$, $p < .05$
- M's = 53.076 IV, 53.764 control
- Bonding to School—Implementation Score: $\chi^2 = 221.3$ (df = 41), $p = .001$, $\gamma = .32$, $p < .05$
- Opportunity for Involvement—Implementation: $\chi^2 = 220.9$ (df = 41), $p < .01$, $\gamma = .31$, $p < .01$
- Actual Involvement—Implementation: $\chi^2 = 150.5$ (df = 41), $p < .001$, $\gamma = .29$, $p < .01$
- Reinforcement Involvement—Implementation: $\chi^2 = 244.1$ (df = 41), $p < .001$, $\gamma = .26$, $p < .05$
- (M's not reported for high & low implementation) (controlling for 5th-grade baseline scores)

(t test, hierarchical linear modeling, Bayesian estimation)

- Bonding to School, School Commitment: $p = .03$, M's = 2.65 IV, 2.50 control
- Bonding to School, School Attachment: $p = .03$, M's = 3.18 IV, 2.84 control poverty
- School Success/Failure, Repeated a Grade: $p = .04$, M's = 1.34 IV, 1.50 control
- School Misbehavior, Self-Report, Past Year ($n = 520$): $p = .02$, M's = 3.66 IV, 3.77 control
- Alcohol Use (10+ past yrs) $p = .02$, M's = 1.34 IV, 2.84 control
- Lifetime Violence: $p = .04$, M's = 2.80 IV, 1.70 control
- Lifetime Sexual Activity: $p = .02$, M's = 2.16 IV, 1.70 control
- Lifetime Been/Cat Woman Pregnant: $p = .02$
- M's = 2.74 IV, 1.70 control
- M's = 1.70 IV, 2.16 control working/middle

(study by tests for means, C for prevalence rates)

- School Crime: $R^2 = .32$, $p < .05$
- $r = .35$ educational commitment
- $r = .23$ belief in school rules
- $r = .13$ ability at school, $r < .05$
- School Misconduct: $R^2 = .29$, $p < .05$
- $r = .26$ ed commit, $.15$ belief, $.26$ attachments
- School Nonattendance: $R^2 = .29$, $p < .05$
- $r = .26$ ed commit, $.12$ belief, $.16$ attachments
- $r = .08$ family involvement

Note: Study results with indirect predictors: parental involvement in school, mother’s education, grades, ethnicity, meal, math ability, living w/step-parent (path analysis)
Synthesis and Epilogue

This review of empirical studies was guided by two objectives: (1) to identify the significant risk factors associated with externalizing behavior problems; and, (2) to estimate the likelihood that each factor influences the occurrence of externalizing behavior problems. In pursuing these objectives, an evaluative framework developed by Kraemer et al. (1997) was used to categorize factors as correlates, predictive risk factors, or causal risk factors based on the scientific evidence to date. Three important lessons were learned quickly. First, research in this area has blossomed in the past decade, resulting in hundreds of empirical papers covering a wide range of possible factors. Second, while a number of significant causal risk factors have been identified (i.e., child hostile attributional processes; parental engagement, validation, and discipline; peer rejection and association with deviant peers), a number of factors have empirical support as predictive risk factors and many more have been identified as concurrent correlations. Third, many researchers have moved beyond a simple risk-factors perspective, driven by findings that pointed to a more complex and richly textured view of children and how they develop from infancy through early adulthood.

The preceding sections of this report have, with some exceptions, stayed close to the original objectives, focusing in turn on each of the many factors discussed in this literature. It is important, however, to expand on these objectives to take into account the complexity of externalizing behavior problems and to encourage the next generation of empirical studies. This expansion includes: (1) the importance of defining externalizing behavior in developmental terms; (2) the need to “put the organism back together” in considering individual child characteristics as they relate to risk and protection; (3) the problem of “correlated environments” and their implications; and (4) the necessity of studying child characteristics and environmental factors in concert.

Defining Externalizing Behavior in Developmental Terms

The past decade has seen a movement from defining externalizing behavior problems as isolated acts or static traits to defining externalizing behaviors as an organized system of responses that emerges, grows, and changes over the course of development. These responses are multifaceted, including not just overt actions but also patterns of thinking and feeling (e.g., hostile attributions, irritability). To completely characterize externalizing behavior problems, researchers must describe not only the kinds of actions, thoughts, and emotions involved, but also how they are interrelated and how these interrelated patterns develop and change over the months and years from infancy through childhood, adolescence, and early adulthood. While a number of recent longitudinal studies have given some initial picture of these developmental “trajectories,” “pathways,” or “reorganizations,” a great many questions remain unanswered. For instance, there are questions about continuity and discontinuity (Which young children remain aggressive throughout childhood, and which do not?) and questions about reorganization of behavior (Which aggressive children later become bullies, which
later become involved with drugs, and which become prosocial and lose their aggressiveness? Given the richness of some of the existing longitudinal studies, some of the questions may be answerable through secondary data analysis.

This more dynamic view of externalizing behavior problems already has had important implications for studying risk factors. Etiology becomes more complicated. A factor that leads to early aggressive behavior may not have as great an effect on later conduct problems. A factor that maintains conduct problems may have had little to do with the initial onset. A factor that leads to desistance from delinquency may have had nothing to do with either bringing about or maintaining the behaviors in the first place. And a factor that puts one child at risk for externalizing behavior in one context may actually protect another child from developing that same behavior in another context.

**Putting the Organism Back Together in Considering Individual Child Characteristics**

A substantial number of studies have focused on the question, what is it about individual children that puts them at risk for engaging in externalizing behavior? Researchers have studied a range of individual characteristics that span multiple levels of analysis within the child, including neurotransmitters, neurohormones, physiology, cognitive processes, expression of emotion, and patterns of behavior. They have developed better and better ways to study these various components of child functioning and have greatly increased our understanding of such characteristics. While such work needs to continue, there is a growing need to develop complementary studies that will expand this focus in two directions.

First, most of the studies reviewed here examine these individual child factors only in relation to single points in time in the development of externalizing behavior problems (e.g., difficult/irritable temperament in young childhood, hostile attributional processes in elementary school-aged children). A few studies have begun to place these factors in a developmental context, studying how such characteristics change with development and are involved in trajectories for externalizing behavior.

Second, most studies to date have restricted their focus to one child characteristic, studying how that characteristic is related to externalizing behavior but providing no information about relationships among different characteristics. Research that attends to more than one characteristic will be important for two reasons. When two or more characteristics are implicated as risk factors, understanding how these systems influence one another is essential in learning how to treat or prevent such behavior. For example, social information processing may shape emotion regulation, emotional regulation may shape social information processing, or the two may reciprocally influence one another or be controlled by a third unknown process. Understanding the nature of these links will help people ascertain whether interventions that target social information processing will be effective independent of any attention to emotion regulation, or whether both need targeting. The latter strategy may be essential if these two systems influence one another.

In addition, cross-characteristic studies can help identify risk factors that moderate other child factors and account for meaningful increases in risk. For example, neural processes related to ADHD may constrain social information processing, which, in turn, increases the child’s risk for externalizing behavior problems. Not only might social information processing interventions be the best way of approaching such cases, but such interventions may require tailoring when used with children with ADHD.
Studying Correlated Environments

This review found that a wide range of environmental factors from a variety of social contexts are likely to influence the developmental course of externalizing behavior problems. Single variables by themselves do a poor job of describing the environments that influence developmental pathways. In addition, the variables we use to describe these environments often co-occur with one another, both within and between social contexts. Recent literature uses terms such as "correlated constraints," "correlated environments," or "bundled risk factors" to describe such co-occurrence. These findings have important implications for research and effective intervention.

- Simple risk factor studies have played an important but more preliminary role in the field. They provided initial evidence about where attention needed to be focused. Now, research on environmental risk factors needs to move to describing environments in more complex ways. Indeed, this review organized environmental factors into three primary areas—family, peer, and the broader social environment. Many correlations and predictive risk factors were identified in each area, as well as several noted causal risk factors. Research now must build on this foundation by examining how factors within and across these areas converge to increase or decrease risk for conduct problems at various phases of development.

- Interventions that focus on single environmental risk factors are very likely to be compromised by hidden constraints, threshold problems, and even boomerang effects. Hidden constraints are linked risk factors that are overlooked. For example, parent training programs may fail to change important parenting behaviors because they fail to appreciate the constraints on parenting imposed by parental depression, interparental conflict, work, or economic conditions. Threshold problems occur when interventions fail to target a broad enough array of important factors. For example, programs that target only reductions in conduct problems may not reach a threshold for effectiveness if they do not also include training in how to carry out prosocial alternatives. Boomerang effects occur when interventions to reduce one risk factor actually enhance other risk factors. For example, interventions that bring children with conduct problems together in groups to work on social skills may inadvertently enhance the formation of self-reinforcing deviant peer groups.

Recent studies have made some headway, suggesting important directions for studying correlated environments and their effects.

- Studies involving more comprehensive assessments of the child's developmental context find important continuities across aspects of the environment. For example, various dimensions of parenting behavior tend to co-occur (validation, monitoring, engagement, discipline) (Barnes, Farrell, & Banerjee, 1994; Farrington & Hawkins, 1991; Haapasalo & Tremblay, 1994; Patterson, Chamberlain, & Reid, 1982; Sampson & Laub, 1994; Scaramella, Conger, & Simons, 1999; Simons, Johnson, Conger, & Elder, 1998; Wasserman, Miller, Pinner, & Jaramillo, 1996).

- Studies that include measurement of more than one social context also find cross-context links (Borduin et al., 1995). For example, parenting patterns are related to peer relationships (Aseltine, 1995; Dishion, Duncan, Eddy, Fagot, & Petrow, 1994; Schwartz, Dodge, Pettit, & Bates, 1997), and communities may reinforce local friendship networks that enhance the operation of these effects (Brody et al., 2001; Sampson, Raudenbush, & Earls, 1997).
• Studies that include assessment of broader social factors, such as regional economic conditions or density of local friendship networks, find that these factors can place constraints on peer and family contexts in ways that are related to externalizing behavior problems. In some cases, these constraints can even eliminate the association between such context factors and externalizing. For example, there is evidence for cultural variation in the effects of parenting on externalizing, such that some parenting variables are related to externalizing in Caucasian families but not in African-American families (Deater-Deckard, Dodge, Bates, & Pettit, 1996).

Studying Child Characteristics and Environmental Factors in Concert

While the study of child factors and environmental risk factors has proliferated, evidence is emerging to suggest that these two domains must be studied together. Three sets of findings demonstrate this, suggesting important directions for future work.

• Child behavior both shapes the child's environment and is a response to that environment. A number of recent studies suggest that trajectories of child development are shaped by patterns of reciprocal influence between the child and the child's social context. Negative emotionality in the infant and young child increases the likelihood of parental hostility and rejection, which in turn increases negative emotionality (Shaw et al., 1998). Conduct problems in middle childhood reduce effective parenting (discipline, monitoring, validation), which reinforces antisocial behavior (Simons et al., 1998). Reduced parental monitoring and warmth in late childhood increases the risk of delinquency, and increased delinquency reduces monitoring and warmth (Jang & Smith, 1997). Recent studies of evocative gene-environment correlations further support the thesis that a range of child characteristics both shape and are shaped by social context (Ge et al., 1996; O'Connor, Deater-Deckard, Fulkner, Rutter, & Plomin, 1998).

• Social contexts can have different effects on the developmental trajectories of different children, depending on what the children bring to the context. Several studies now suggest that specific environmental factors may be risk factors for some children, have no effect on others, and be protective factors for still others. For example, high levels of parental control appear to increase risk for children with one temperament but protect children with a different temperament (Bates, Pettit, Dodge, & Ridge, 1998). Again, these patterns also appear in behavioral genetics studies, indicating that heritable child characteristics and particular environmental factors interact in influencing the developmental trajectories of externalizing behavior problems (Cadoret, Yates, Troughton, Woodworth, & Stewart, 1995).

• These two patterns, reciprocal effects and child-environment interaction effects, must also be considered in a developmental context. There is evidence that the reciprocal effects between child conduct problems and lax parental monitoring are strongest before age 15 and that in later adolescence it is delinquency that leads to lax monitoring (Jang & Smith, 1997). Similar fading of reciprocal effects may occur for conduct problems and poor parental disciplinary practices, with the latter much more likely to drive the former in late adolescence (Cohen & Brook, 1995). This change may also be concomitant with increasingly reciprocal effects among antisocial adolescent peers.

Implications for Future Research

The four issues discussed above reflect the progress of a scientific field as it grapples with the complexities of human development. Investigators
concerned with externalizing behavior problems are moving beyond simple risk factor studies into the study of risk and protective mechanisms that not only explain variance in predicting outcomes, but also suggest malleable processes that can be tested for causality and become targets for intervention. These risk mechanisms are developmental and appear to involve more complex interactions between organism and environment, which themselves change in potency over the course of development.

Acknowledging and truly taking into account this complexity will be the task of the next generation of risk research in externalizing behavior problems. Indeed, several recent studies have moved in this direction by studying how selected child factors interact with specific environmental factors at critical points in development and examining how patterns among these factors affect the development of externalizing behavior problems (Conger et al., 1992; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Henry, Caspi, Moffitt, & Silva, 1996; Pettit, Bates, Dodge, & Meece, 1999; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). These initial studies are taking on the challenge of reducing the now-overwhelming four-plus-dimensional matrix (resulting from the intersection of child, family, peer, broader social environment, and development) to workable sets of multiple factors that hold significant power for predicting risk and revealing stronger groupings of causal risk factors for externalizing behavior problems.

What can be used to guide this complex and challenging work? The research reviewed here suggests four strategies for advancing research on risk factors and interventions for externalizing behavior problems.

- Several important factors have been identified as causal risk factors, including child hostile attributional processes; parental engagement, validation, and discipline; and peer rejection and association with deviant peers. It is critical that these findings be disseminated to the public and that effectiveness research be conducted with the intervention strategies known to affect these factors to ensure appropriate implementation by communities, schools, and mental health service systems.

- The framework provided by Kraemer et al. (1997) suggested that research on risk factors relevant to developing interventions can follow a developmental course of its own. Once factors are found to be correlated with outcomes, further research should document the potential for prediction and, ultimately, the potential for causation. The current review identified a number of predictive risk factors and concurrent correlations with externalizing behavior problems. It is critical that this research be advanced (i.e., that concurrent correlations be tested for predictive risk and effect size, and that potent predictive risk factors be tested for potential causality). This type of research will provide the foundation for developing more effective interventions.

- Studying multiple factors simultaneously is critical for furthering intervention and risk factor research. Simple risk factor studies have played an important role, but the field must advance to describing, measuring, analyzing, and experimentally intervening with child factors and environments in more complex ways.

- A developmental perspective will need to be incorporated into all research. Externalizing behavior problems have a developmental course, and it is likely that the risk factors and mechanisms that lead to this development also change over time. In particular, it is important to know if there are particular points in development when specific risk factors converge to substantially increase vulnerability or when there are windows of opportunity for intervention.
References


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