CHAPTER 13

The Development and Ecology of Antisocial Behavior in Children and Adolescents

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Antisocial behavior is disruptive to the individual, to family and friends, and to the community at large. It is for this reason that adults attempt to reduce antisocial behavior in efforts to socialize children. When such efforts fail, parents and caregivers often seek help, such as in mental health clinics. It is estimated that 50% to 75% of all referrals focus on behavior problems in children (Kazdin, 1987, 1993).

Among all the child adjustment problems, the literature on the study of child and adolescent antisocial behavior is the most abundant and historically rich (see Costello & Angold, 2000). Initially, thinking about the origins and solutions to antisocial behavior in children and adults was largely philosophical and speculative. Plato's *The Republic* (Hamilton & Cairns, 1973), written c. 360 B.C., provides a detailed sociopolitical system for promoting the character of youth so as to minimize behaviors thought to detract from a harmonious state and promote behaviors conducive to community living.

A critical piece to the philosophical puzzle is whether antisocial tendencies are innate or are acquired through the vagaries of social living and misguided socialization efforts. Hobbes, in *Leviathan* (Rogers & Schulman, 1651/2003), assumes that antisocial tendencies are innate, and consequently, prosocial behavior conducive to group living required careful training and socialization. In contrast, in his treatise on *Emile,* Rousseau (Friedlander, 1762/2004) proposed that children by nature are prosocial but misguided efforts by adults transform goodness into antisocial behavior. The implication is that if children were raised in a natural, benevolent state, many problem behaviors would be minimized or eliminated. John Locke (Anstey, 2003) proposed a position that could be seen as neutral to these two perspectives, assuming that children were a tabula rasa with respect to good and evil and that all behaviors were simply outcomes of experience and learning. This has often been associated with learning theory accounts of individual differences. A fourth perspective, attributable to Darwin (1991), is that individuals actively learn behaviors that promote survival of the individual and the species. Thus, individuals come to social living with a propensity to learn some behaviors over others, based on biologically based biases in learning. The key is that behaviors are more easily learned when they function to increase the survival of the individual and genetically related kin. As we shall see, the fourth perspective is a compelling philosophical framework for thinking about the development and ecology of antisocial behavior.

Not until recently have the tools and strategies of science been applied to understanding human behavior in general and antisocial behavior in particular. There is a clear sense that empirical formulations of antisocial behavior

are progressing in respect to replication as well as validation in the context of intervention (Dishion & Patterson, 1999). However, in considering the impressions of the earliest professionals charged with the responsibility of managing antisocial children, one wonders just how much progress has been made. For example, consider the following statement by Adams (Carpenter, 1970, p. 15), who was responsible for managing antisocial youth in a reformatory school in nineteenth-century England:

> Sergeant Adams states before the Select Committee of the Lords, that of the 100 prisoners whom he has to try every fortnight, from 16 to 40 are boys; some even of the age of 7; a few of 8, and a great number of 9 and upwards; of these children the offenses are, for the most part, of a pilfering description, to which the young children are tempted by older persons. "A large portion of these poor children," says Mr. Adam, "are wholly and entirely without friends and relations of any kind; others have profligate parents who neglect them; and almost all are quite uninstructed in religious, moral and social duties. I should say the evil is far more deeply seated than in the natural disposition of the children themselves. I do not think they are naturally worse than other children themselves; but that these offenses spring from the want of proper moral and religious education and in the want of proper friends to attend to them."

From Sergeant Adams' perspective, many antisocial youth are early starters, often male, have poor peer relations, and come from families that could be described as disrupted parenting. Sergeant Adams would minimize the contribution of genetic factors in favor of environmental effects.

The early work on antisocial behavior was largely concerned with managing children who broke the law and required remedial, or at least custodial, intervention. In the twentieth century, however, psychologists entered the intellectual landscape. Healy (1926) published the first psychologically oriented treatise theorizing on the etiology and treatment of antisocial behavior. His thinking, heavily influenced by the psychodynamic theory of that time, emphasized internal, intraindividual factors in the etiology of crime, especially lack of cognitive abilities (i.e., "dull thinking"), and secondarily, problematic parenting. Even though he notes that peers are most often a proximal factor in the commission of antisocial acts (nearly every case reviewed!), in his mind, peers were unlikely to be a significant etiological factor. His thinking was that failure to care about mores and to inhibit antisocial behaviors was an intrapersonal characteristic that could only be solved by treating the individual. Despite this individual orientation, Healy was also an empirical pragmatist. Ten years later, he published quasi-experimental findings on outcomes associated with two different correctional practices in Chicago and Boston, noting that about 61% of the males and 46% of the females would eventually recidivate (Healy & Bronner, 1936). Rates of recidivism, he noted, vary as a function of the correctional strategy used. In Chicago, where institutionalism was the dominant strategy, failure rates reached 70%, whereas in Boston, where foster care was the pervasive practice, recidivism was only 27%. These writers, aware of the limitations of quasi-experimental strategies, tentatively suggested that institutionalization may not be the ideal solution for diverting lives of crime for antisocial youth. This suggestion has gone largely unheeded, despite the results of later studies using random assignment (Chamberlain & Reid, 1998; Eddy & Chamberlain, 2000).

The continued application of psychodynamically oriented treatments for antisocial children and adolescents generally did not produce satisfactory results. Influential practitioners and theorists such as Redl and Wineman (1951, 1952) reported dramatic failures in their efforts to treat antisocial youth. These failures were followed by extensive reformulations of psychoanalytic theory and the introduction of the attachment construct and ethological theory (Bowlby, 1969). The pessimism was supported by empirical findings: Nothing was effective when working with antisocial children (Levitt, 1957, 1971).

The *internal trait* model was the overarching paradigm that integrated these theories and interventions designed by psychologists and criminologists. From this perspective, the traits are intraindividual dynamics whose prime characteristics are stability and continuity of behavior. Indeed, the stability and continuity of antisocial behavior was such that the use of the term *trait* was empirically justified (Loeber & Dishion, 1983; Olweus, 1979). A trait model (Goldberg, 1994), however, contained no information about mechanisms of change. The trait models are indeed empirically based but fall short of identifying mechanisms that account for stability and, more important, provide no guidance as to how to prevent or reduce antisocial behavior in children and adolescents. Not until the 1970s and 1980s was it understood that there is an important link between understanding a development process and selecting the appropriate prevention and treatment.

Considerable progress has been made during the past 20 years in providing an empirical account for antisocial behavior in children and adolescents. These studies represent a fusion of the seminal works by Lee Robins (1966) and other sociologists (see review by Loeber & Dishion, 1983), the life course perspective of Glen Elder (1985), measurement theorists (Campbell & Fiske, 1959; Cronbach &

Meehl, 1955), and the careful observation research of criminologists (e.g., McCord, McCord, & Howard, 1963) and developmental (e.g., Dawe, 1934) and clinical psychologists (e.g., Patterson, Littman, & Bricker, 1967; Raush, 1965). These investigators brought forth a strong focus on measurement, longitudinal designs, and a consistent pattern of findings of environmental correlates and predictors of antisocial behavior. More recently, investigators have moved to what we refer to as a *process account* of antisocial behavior, which provides an analysis of the etiological dynamics of growth and desistance over time. In this way, the new wave of studies in the past 2 decades represents a strategy of linking longitudinal research with intervention studies, where developmental processes are targeted in the efforts to reduce problem behavior, but also to test hypotheses regarding the mechanism of change.

At this juncture, we are able to provide a stronger proposal for the etiology of antisocial behavior in children and adolescents, compared with our previous review (Dishion, French, & Patterson, 1995). In some ways, the picture has simplified, especially with respect to what we know about the nature and timing of major environmental effects, biological underpinnings, and dynamic and functional processes as they unfold over time. To begin, however, it is necessary to consider what we now know about the developmental variation and changing form of antisocial behavior from early childhood to late adolescence.

DEVELOPMENTAL PATTERNS

All forms of *antisocial behavior* share a common characteristic: They are experienced as aversive, disruptive, or unpleasant by those who are victims or those who are close to the youth. During adolescence, new behaviors are added, such as drug use and sexual activity. These behaviors are often thought of as "victimless." Adolescent substance use and precocious sexual behavior are known to lead to problematic adult adjustment and also to be a source of conflict between adults and youth. To address this heterogeneity, the more general term of *problem behavior* is used. Figure 13.1 provides an overview of the kinds of behaviors that are experienced as aversive by victims or deemed problematic by adults from early childhood to late adolescence. The perspective of the current *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) is reflected in Figure 13.1 as well.

Several investigators recognized distinct types of antisocial behavior and conduct problem children (e.g., Jesness, 1977; Patterson, 1982; Quay, 1993). Our first efforts to observe antisocial children and their families suggested that

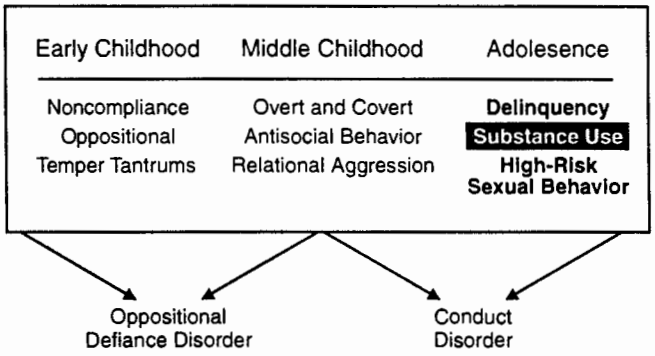

Figure 13.1 The labeling of problem behavior through childhood to adolescence.

interactions observed in the homes of youngsters referred primarily for aggression were fundamentally different from those referred for stealing (Patterson, 1982). The differences were detectable in the observed behavior of both the child and the parents. Considering findings such as these as well as a meta-analysis of child referral problems, Loeber and Schmaling (1985) introduced the terms *overt* and *covert* antisocial behavior, a taxonomy that has stimulated a great deal of research over the past 2 decades (e.g., Hinshaw & Anderson, 1996; Hinshaw, Lahey, & Hart, 1993; Liau, Barriga, & Gibbs, 1998).

If we take a psychometric approach to conceptualizing antisocial behavior, we might consider covert and overt antisocial behavior as different behaviors within an overall trait for being antisocial (see Dishion, French, et al., 1995; Patterson, Reid, & Dishion, 1992). This would be consistent with problem behavior theory (Jessor & Jessor, 1977) in which adolescent problem behaviors are considered to be one overall syndrome. The findings from the Oregon Youth Study provided support for such a perspective. Using structural equation modeling, we found a correlation of 1.0 between the two constructs (Patterson, Reid, et al., 1992). Obviously, boys who engage in high rates of overt antisocial behavior also engage in high rates of covert antisocial behavior. The correlation speaks to the fact that by early adolescence, both forms belong to the same general class of behaviors.

Within the class of aggression, distinctions can also be made. The most critical appears to be that between *reactive* and *proactive* aggression in children (Dodge & Coie, 1987). Again, reactive and proactive types of aggression are highly intercorrelated (Dodge & Coie, 1987; Poulin & Boivin, 2000b). A developmental analysis of proactive and reactive aggression suggests unique antecedent conditions, sequelae, and functional mechanisms (Crick & Dodge, 1996; Poulin &

Boivin, 2000a; Price & Dodge, 1989; Pulkkinen, 1996; Vitaro, Brendgen, & Tremblay, 2002).

More recently, the concept of relational aggression has been put forward, fitting best within the realm of covert antisocial behavior (Cairns & Cairns, 1994; Crick, 1996; Crick & Bigbee, 1998; Crick et al., 1997; Grotpeter & Crick, 1996; Underwood, 2003). Relational aggression is directed to peers and involves behaviors such as spreading rumors, ostracizing, and purposely manipulating relationships to the detriment and pain of a recipient.

As can be seen in Figure 13.1, the developmental sequence from overt to covert behaviors can be mapped onto the *DSM-IV* nomenclature of Oppositional Defiant Disorder and Conduct Disorder. However, relational aggression, to date, has no clear home in this or the *International Classification of Diseases* diagnostic system.

In contrast to our earlier review (Dishion, French, et al., 1995), we see the value in making distinctions between highly correlated but topographically unique forms of child and adolescent problem behavior. As a heuristic model, in this review, we group reactive forms of aggression and antisocial behavior as overt and antisocial behaviors that often involve peer coordination and avoidance of adult detection as covert. As we shall see, the critical issue is the developmental and relationship context in which these behaviors emerge. Studies show that overt and covert forms of behavior come into play at very different developmental stages and are controlled by very different functional mechanisms and social agents. Building a model of child antisocial behavior requires an intimate knowledge of these unique developmental patterns.

Overt Antisocial Behavior

During the first 2 years of life, it is not unusual for children to be oppositional and difficult to control at times. Tremblay (2000) has argued that if 2-year-olds were physically as large as adults they would be dangerous, as they do hit and become quite angry. By middle childhood, the range of child behavior, the places in which they occur, and their form and function become more complex.

Given that children begin to engage in aggression and oppositional behavior as toddlers, maternal reports would seem relevant to understanding early developmental trajectories. Systematic study of maternal reports in a large Canadian cohort, in fact, reveals a clear decrease in these behaviors from ages 2 to 11 (Tremblay, Masse, Pagani, & Vitaro, 1996; see Figure 13.2). The findings are consistent with those from mothers' longitudinal ratings of overt antisocial behaviors cited earlier. Longitudinal studies by

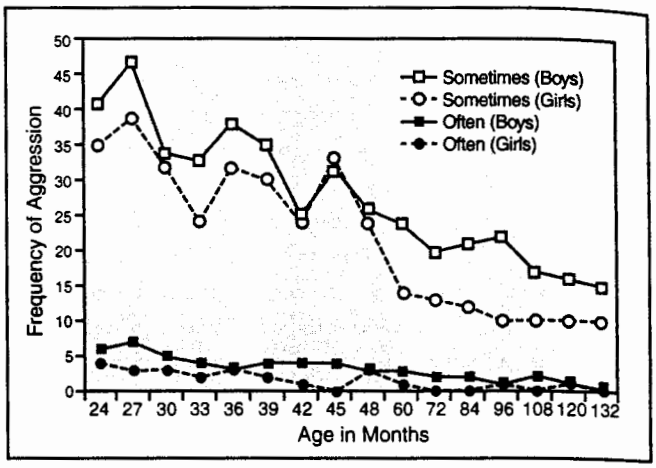

Figure 13.2 Decreases in aggression in early childhood. Adapted from Tremblay et al., 1996.

Cairns, Cairns, Neckerman, Gest, and Gariepy (1988) found a similar decrease in physical aggression between ages 10 and 18 years, based both on teacher ratings and self-report data. Tremblay et al. (1999) also found a decrease in teacher reports of physical aggression for boys from 6 to 15 years of age. The large-scale Dutch longitudinal study of maternal ratings of children ages 5 through 18 years showed negative slopes for both boys and girls on aggressive behavior (Stanger, Achenbach, & Verhulst, 1997).

Of particular interest in the work of Tremblay and his colleagues is the finding that during the elementary grades, there are few if any new cases of physical aggression added to the cases identified by grade 1 (e.g., a low false-negative error; Nagin & Tremblay, 1999). The findings were essentially replicated in the longitudinal study of at-risk boys from grades 1 through 5 (Patterson & DeGarmo, 1997). Only 1.5% of the boys in the normal range at grade 1 had moved to a clinical range for overt antisocial behavior by grade 5. Again, this suggests a very low false-negative error in predicting later adjustment. Evidently, the most severe problems associated with overt antisocial behavior are in place before grade 1, and few new cases are added after that. The fact that there are few new cases added suggests that the preschool, familial training phase is critical in understanding the emergence of aggression in young children.

There is a strong negative slope describing the relation between the age of the child and the frequency of reported overt forms of antisocial behavior. This relation holds across teacher, parent, and observers as assessment agents. The consistency of the developmental findings demands an explanation. Why is there a drop?

We hypothesize that as children age, adults become increasingly vigilant and attentive to all forms of overt anti-

social behavior and effectively reduce such behavior through punishment or by reinforcing prosocial alternatives to aggression (asking, waiting, sharing, turn taking, etc.). The term reactive aggression also provides a clue. Children who initially engage in aggression are essentially reactively coercive, using such tactics as crying, whining, hitting, and persistence to reduce adult socialization efforts or aversive intrusions by peers. Fortunately, over time and through socialization, children become more regulated and planful in their response to their social environment. They become less reactive to aversive experiences, and if they do not, they pay the consequences of poor peer relations and social rejection (Coie & Kupersmidt, 1983; Dodge, 1983; Poulin & Boivin, 2000a).

The picture is more complex, however. As children desist in some forms of antisocial behavior, they pick up new behaviors. For example, proactive aggression emerges in middle childhood (Poulin & Boivin, 2000b), which appears be a consequence of involvement with other, aggressive peers. Snyder (Snyder, Reid, & Patterson, 2003) hypothesized that the effect of these changes in adult and peer contingency might drive aggression "underground." Some children may simply learn to avoid detection and, in so doing, also avoid the negative consequences supplied by adults. In this sense, they become more regulated but also, unfortunately, more deviant as well. The child simply shifts to more covert forms.

Covert Antisocial Behavior

As defined earlier, covert antisocial behavior includes aggressive acts that seem designed to avoid detection. For example, proactive and relational aggression can be seen as a covert form of antisocial behavior. As such, forms of covert antisocial behavior are detectible in middle childhood (age 6 years), increasing slowly during late childhood, then accelerating at early adolescence. Of particular relevance for socialization theory is the fact that throughout the developmental course, growth in overt and covert behaviors have diametrically opposite slopes. After the age of 2 years, the slope for overt forms is essentially negative through adult years. Developmentally, covert behavior begins with a neutral slope and then shifts dramatically to positive during early adolescence. An analysis of maternal ratings of boys' covert antisocial behavior is summarized in Figure 13.3. Based on data from a large prevention sample ($N = 204$), the ratings covered the interval from grades 1 through 5 (males; Patterson & Yoerger, 1997). Similarly, the longitudinal analyses of maternal ratings for grades 1 through 5 showed a nonsignificant positive slope (Patterson & Yoerger, 2002).

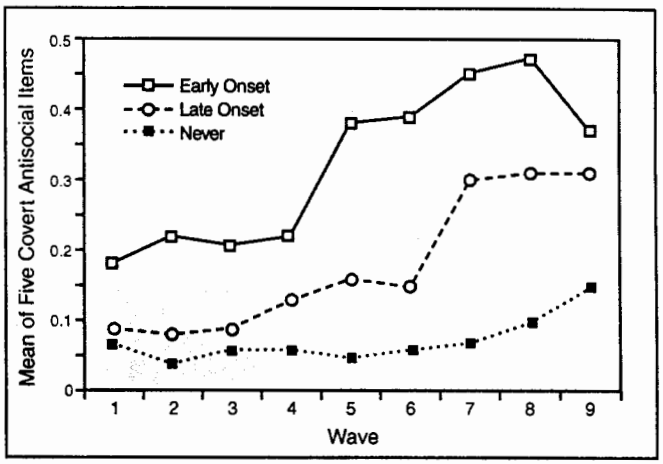

Figure 13.3 Changes in covert antisocial behavior for three groups of LIFT buys. Adapted from Patterson and Yoeger, 2002.

It becomes difficult, therefore, to really know whether there is an overall decrease in aggression from age 2 years through adolescence. It is conceivable that as overt forms decrease, adding the growth in covert behavior would generate a total output score that is closer to a zero slope. Maternal ratings from a large prevention trial sample offer some support for the idea that total output may remain stable from one grade to the next for grades 1 through 5 (Patterson & Yoerger, 2002).

It would be expected that measures of overt antisocial behavior during childhood would provide low-level but significant predictions of adolescent and adult crime. For example, in a systematic analysis of six longitudinal data sets, overt forms of antisocial behavior predicted both adolescent physical aggression and covert antisocial behavior (Broidy et al., 2003). It is noteworthy that female adolescent antisocial behavior is not predicted by early overt antisocial behaviors in these six longitudinal data sets.

This raises the question as to the most significant predictors for adolescent and adult crime. For example, it could be that the more severe forms of antisocial behaviors were the best predictors. We were pleased to find that such weighting schemes were not necessary. In fact, the total frequency of relatively trivial forms of antisocial behavior is strongly correlated with more severe forms of delinquent behavior. For example, in the Oregon Youth Study (OYS) by Capaldi and Patterson (1996), the frequency of self-reported trivial crimes correlated .63 with the frequency of self-reported severe crimes. Also, youth who commit more frequent crimes are at significantly greater risk to commit violent crimes. For example, if the adolescent had been arrested three or more times, the likelihood was .47 that he would commit a violent crime. The comparable figure for Farrington's (1991) London cohort was .49. Frequency, of

course, suggests versatility (Loeber, 1991; Loeber, Green, Keenan, & Lahey, 1995; Loeber et al., 1993). Initially, we had thought that perhaps the more severe forms of overt or covert behavior would serve as better predictors.

Delinquent Behavior

Delinquent behaviors are an important subset of antisocial (overt and covert) behavior. What makes them unique is that society considers them to be illegal. What makes this complex is that the definition of what is illegal can, and does, change over time. Many delinquent behaviors also have a victim. Examples include robbery, theft, burglary, and vandalism. Other behaviors are statutory, such as substance use and sexual precocity. Here, victim's status is unclear, but technically, our definition of antisocial behavior requires a victim. Thus, substance use is included in this review only as it relates to the etiology and course of antisocial behavior. It is clear that there are youth who engage in these behaviors but who are not involved in antisocial behavior (Dishion & Loeber, 1985; Loeber, 1988), and peer and family dynamics reflect this difference (Dishion & Loeber, 1985), in that youth who use substances and are not antisocial are generally exposed to less risk within the family and peer domains.

If one focuses narrowly on illegal, criminal, or delinquent behavior, it is clear that there are enormous differences in the age at which individuals first engage in these behaviors. There are 7-year-olds who are arrested; others are arrested in adolescence (Moffitt, 1993; Patterson, Crosby, & Vuchinich, 1992; Robins, 1966). Generally, there is positive growth in criminal behavior during adolescence (Achenbach & Edelbrock, 1979), which peaks somewhere between 16 and 18, depending on the context and behaviors included in the study. Following the peak is a relatively rapid decrease in illegal behavior, forming a negative quadratic function. This is often referred to as the age-crime curve (Gottfredson & Hirschi, 1990). One of the most interesting findings from the OYS sample was the data showing that 18% of youth arrested as adults had no prior history of arrests; some of the males waited until adult status to commit their first crime (Patterson & Yoerger, 2002).

The developmental trends in criminal behavior among youth and young adults are likely to be obscured by trends in *learning to avoid detection.* By definition, teachers and parents probably have only a limited awareness of the frequency of covert acts. For example, early-onset boys in the OYS show the expected decrease in police arrests starting at around age 17 years. During that same interval, however, the early-onset boys self-reported a fourfold increase in index crimes (Patterson & Yoerger, 1993). According to the *learning to avoid detection* hypothesis, this may simply reflect the fact that after several arrests, the boys improved their skills in learning to escape police detection. Farrington, Jolliffe, Hawkins, Catalano, Hill et al. (2000) found that the probability of being referred to juvenile court actually decreased as a function of frequency of self-reported crimes. Again, this suggests to the present writers that the more prolific offenders had learned to avoid detection.

Criminology's study of specialization would be one well-known alternative to the frequency hypothesis. Are there numerous paths to each specialized crime (e.g., safe-cracking, mugging, arson)? Farrington's (1991) analysis of the London cohort study found no tendency for males in the sample to specialize in property or person crimes.

We hypothesized that understanding the overt-to-covert sequence is absolutely essential in planning prevention studies. We also hypothesized that measures of the overt-covert sequence should provide a useful basis for predicting later juvenile and adult crime. If the model includes only measures of overt antisocial behavior, the prediction model will be weakened. It is also assumed that a model based only on measures of covert antisocial behavior assessed during adolescence will be very effective in predicting adolescent offending but weak when predicting adult crime. The reason for this is that both the early- and late-onset boys are heavily involved with deviant peers, as shown in Patterson and Yoerger (1993, 2002). The OYS data show that most of the late-onset boys score high on covert scores but as adults become desistors (Patterson & Yoerger, 1997). When predicting adult crimes, the most effective prediction model would include the sequence of first overt and then covert (Broidy et al., 2003; Patterson & Yoerger, 1997, 1999).

Trajectories that are high on both overt and covert forms would also be characterized by high overall frequencies. Both sets of information would predict early onset for delinquency. Loeber (1991; Loeber et al., 1993, 1995) showed that indeed it is the case that simply combining overt and covert generates significant predictions. As yet, no one has compared the relative efficiency of using childhood frequency measures of overt and covert, adolescent measures of covert, and various sequential patterns.

Age of onset for delinquent behavior occupies a salient place in the traditional literature of criminology. Robins (1966) noted that boys arrested at a young age had more serious outcomes than those arrested in later adolescent years. Several decades of studies firmly establish the correlation between early onset and total frequency of later ar-

rests (Loeber & Farrington, 2000; Patterson, 1996; Patterson, DeBaryshe, & Ramsey, 1989; Patterson & Yoerger, 1997). It is, therefore, not surprising that the earlier the onset, the greater the risk for chronic arrests. For example, in a study of the OYS, Patterson and Yoerger (1993) found a correlation of .93 between the age of onset of first arrest and the likelihood of a fourth arrest. Given early onset (arrest before age 14 years), the likelihood of three or more juvenile offenses was .76 (Patterson, Forgatch, Yoerger, & Stoolmiller, 1998).

Several writers have emphasized the utility of differentiating between early- and late-onset delinquents (Moffitt, 1993; Patterson et al., 1989; Robins, 1966). In the OYS studies, about half of the police arrests involve early offenders and half involve late offenders. In the Dunedin studies, about 10% of the sample were defined as early onset (life-course-persistent) and 25% as late onset (adolescent-limited). The prevalence rates for the Oregon sample were 26% and 29% for early and late, respectively. The differences in prevalence for the early starters reflect the fact that the Oregon sample consisted of at-risk families living in high-crime areas, whereas the Dunedin studies were based on carefully drawn birth cohorts. Although the Oregon and New Zealand studies agree on the importance of differentiating the two paths, they are in almost complete disagreement as to the mechanisms that produce these outcomes. The causal mechanism models are reviewed in a later section.

It is now understood that the commission of antisocial acts usually precedes the commission of delinquent acts by several years. For example, data from three samples showed that 10% to 25% of the sample self-reported serious and violent behavior by age 10 years (Loeber & Farrington, 2000). Data from the OYS were used to test the hypothesis that boys from disadvantaged families and inept discipline practices would be among the first to be arrested (Patterson, Crosby, et al., 1992). Both variables made significant contributions to early arrest. It was assumed that a composite (overt plus covert) measure of antisocial behavior assessed at age 10 years would be the major predictor. In effect, the contribution of inept discipline to age of first arrest would be mediated by the antisocial variable. In the event history analyses, as predicted, when the trait score was introduced into the regression analyses, the relative contributions of discipline and socioeconomic status became nonsignificant. The highly significant contribution of the antisocial trait score showed that the more antisocial the boy, the earlier his first arrest.

In that study, the findings from the distribution of hazard rates carry a particularly interesting piece of information. The hazard rate describes the percentage of boys' first arrest at a particular point in time. Figure 13.4 compares the distribution of hazard rates for boys scoring above the median on the antisocial composite with those scoring below the mean for the antisocial trait. It can be seen that at age 10, about 5% to 6% of the boys were involved in their first arrest. The peak risk for this group occurred at age 13, when 23% of those not previously arrested were arrested.

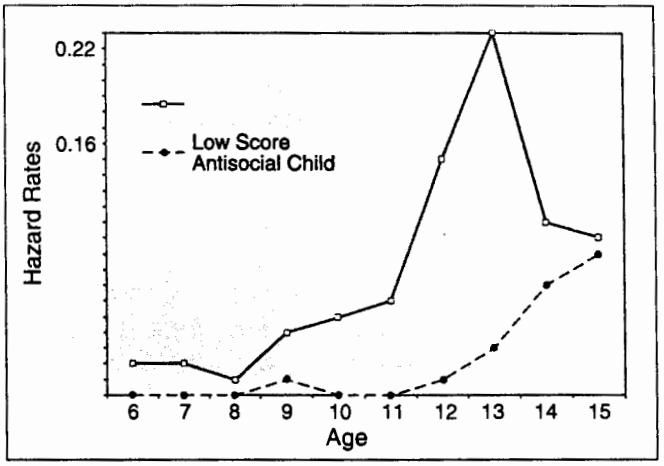

Figure 13.4 Distribution of hazard rates for high- and low-antisocial boys.

Of particular interest is the distribution of hazard rates for boys below the mean for antisocial behavior (i.e., late-onset boys). At ages 14 and 15, there was a steady increase in risk for first arrest. These findings describe the trajectories for the late-starter group. In the Oregon model, the late-starter group tends to be less antisocial as children and are at increasing risk for a first arrest after the age of 15.

Moffitt, Caspi, Harrington, and Milne (2002) followed up the Dunedin sample through age 26 to demonstrate that, as adults, the early-onset group was more at risk for substance use, mental and personality problems, financial and work problems, and violent crime. The late-onset group also tended to be at elevated risk for most of these problems, but at less extreme levels. Moffitt et al. assume that the late-onset group is very near to normal levels in terms of childhood risk variables: "However, because their predelinquent development was normal and healthy, most young people who become AL (adolescent limited, late onset) are able to desist from crime when they age into real adult roles" (p. 280).

We hypothesize that developmental and relationship dynamics account for the differences in adult outcomes observed between early- and late-starting delinquent adolescents. In fact, we see the distinction between the two groups as one of gradations and the groups unlikely to be unique

taxonomic groups. For example, DiLalla and Gottesman (1989) compared persistent and transitory offenders and found that the latter were better adjusted than persistent offenders. However, it was also the case that the transitory offenders were less well adjusted than were the nonoffenders. Findings from the OYS were consistent with the hypothesis that the late-onset group was less deviant than the early-onset group but more deviant than nonoffenders.

In our previous review, we introduced the "marginal deviation hypothesis," which was essentially a statement of equifinality, especially for late-onset delinquent behavior (Dishion, French, et al., 1995). Simply put, a variety of social and biological circumstances (e.g., temperament, academic problems, divorce, stepparenting) can be linked to engagement in peer groups that support growth in specific forms of problem behavior. Indeed, for this group, having positive peer relationships may be part of the problem. Indeed, a composite rating (peers, teachers, parents) showed that the late-onset group had better relationships with peers than did the early-onset group. As noted in a later section, the evidence suggests that early onset is correlated with more pervasive family dysfunction, and late onset and persistence among early starters is explained by the emergence of peer dynamics in adolescence (Patterson & Yoerger, 1997, 2002). Despite the diverse etiological circumstances of each developmental pattern, it is reasonable to conclude that late-onset delinquents are anything but normal; their problems are simply less severe. This may in part be a function of positive aspects of their socialization, in particular the development of a modicum of self-regulation and control, which enables the eventual formation of positive work and relationship skills.

Although the topic of causal mechanisms is discussed in a later section, it should be noted here that the critical variable determining membership in early, late, or nonoffending trajectories is a time-dependent measure of involvement with deviant peers, as shown in the studies by Patterson and Yoerger (1997, 2002). Several studies now show that bursts in involvement in deviant peers is associated with increases in substance use (Dishion & Medici Skaggs, 2000) and delinquent behavior (Elliott & Menard, 1996; Patterson & Yoerger, 2002). Although many theorists emphasize the role of peers (e.g., Elliott, Huizinga, & Ageton, 1985; Moffitt, 1993; D. W. Osgood, Wilson, O'Malley, Bachman, & Johnson, 1996; Warr, 1993), we specifically target the social interaction dynamics and behavior contingencies as critical for understanding the emergence and progression of antisocial behavior in adolescence (Dishion, Spracklen, Andrews, & Patterson, 1996). The added emphasis on relationship dynamics, we hope, is useful for the design and execution of interventions that reduce antisocial behavior.

Trajectories

The analysis of developmental patterns was often described as an analysis of "pathways" (e.g., Loeber, 1988). The idea is that there are unique events that unfold in an orderly sequence that lead to a final developmental outcome. This appealing metaphor was just that until recently, when the advances in quantitative methods allowed for estimation of person-centered longitudinal patterns that are now referred to as *trajectories* (Muthén & Muthén, 2000; Muthén & Shedden, 1999; Nagin, 1999).

These quantitative innovations have led to several interesting trajectory studies, confirming the points made earlier. For example, Shaw, Gillom, Ingoldsby, and Nagin (2003) identified longitudinal trajectories of aggressive behavior that were highly predictive of school-age conduct problems. The work by Lacourse, Nagin, Tremblay, Vitaro, and Claes (2003) examines developmental trajectories leading to delinquency and violence in adolescence. Most analyses of developmental trajectories produce a high stable group and a consistently prosocial group. The remaining groups vary with respect to developmental patterns. For example, the study by Wiesner and Capaldi (2003) produced six different trajectories with the sample of 204 OYS males. These elegant statistical models will certainly become the wave of the future. As is typical, new quantitative models provide a basis for seeing new complexities in establishing trajectories that may depend on measurement issues, sample size, the kinds of causal predictors entered into the analysis, and the developmental period under consideration. A simple case in point is that arrest, self-report, teacher report, and parent report data may provide unique perspectives on the number and shape of developmental trajectories in antisocial behavior, as found in the study by Cairns and colleagues (Cairns, Cairns, Neckerman, & Gariepy, 1989). Moreover, the trajectories for male and female youth may be distinct, as indicated by less of a connection between overt antisocial behavior and the later emergence of covert behavior problems in girls (Moffitt, Caspi, Rutter, & Silva, 2001).

An often neglected issue in studying trajectories is the explanation of persistence and desistance. In Loeber's (1982) reanalysis of conviction data, both suggest that the actual shape of the trajectory curves vary as a function of age of onset. For example, in examining data sets based on official records, Patterson and Yoerger (1993) found that

boys who begin their arrest career by ages 10 through 12 years had a unique shape to their trajectory. The curve was initially flat or even positive and then dropped steadily to young adult years. However, the boys first arrested at ages 14 to 18 years started somewhat lower and showed an immediate precipitous drop at young adult years (Patterson & Yoerger, 1993).

Desistance is particularly interesting. An analysis of the OYS longitudinal data set showed that at grade 4, 49 boys scored at the 75th percentile on a composite measure of overt antisocial behavior. Of these, 22 failed to become involved in growth for covert behavior over the ensuing 8 years (Patterson & Yoerger, 1999). From our perspective, this failure implies that they were not involved in deviancy training provided by deviant peers (Patterson, Dishion, & Yoerger, 2000), or that they actively avoided deviant peers and their influences to persist on a normative trajectory (T. Gardner & Dishion, 2005). This third group is of real interest because it directly addresses a comment made by Robins (1966) and frequently cited by trait theorists to the effect that most (about half) antisocial children do not grow up to be antisocial adults. In the OYS study, this group represented 44% of the subset of overt antisocial boys. Moffitt et al.'s (2002) careful analyses of the adult follow-up data for the Dunedin study showed very similar findings. They found that about 8% of their male cohort (10% for OYS) were members of a subset who showed high levels of antisocial involvement during childhood but only low to moderate participation during adolescence. Moffitt and her colleagues labeled them "the recovery group," implying a shift away from the antisocial trajectory. However, from the perspective of the Oregon model, this subset failed to move on and receive advanced training from deviant peers. In the Oregon model, we assumed that these individuals are anything but recovered: They remain antisocial but are limited to overt forms of expression. The fact that they did not participate in activities with their deviant peers suggests either poor peer relationships or active efforts on the part of the child and family to avoid deviant contexts.

Moffitt et al.'s (2002) analyses of this third group found that, as adults, they were suffering from internalizing forms of psychopathology, none had married, many had difficulty in making friends, and many were isolates. According to Moffitt et al., 28% of this third group as adults had court records. This was compared to 8% of the Oregon marginal-isolate group. We hypothesized that this third group would make a substantial contribution in accounting for individuals identified by Robins (1966) as antisocial children who failed to continue on to become adult criminals. As noted earlier, the 22 members of this third trajectory represented 45% of our sample that had been identified as severely antisocial children.

We suggest that there are three pathways necessary to understand delinquent behavior. Each of them has a very different childhood history. The early-onset delinquent was trained by family members to engage in high rates of overt antisocial behavior and lacks a wide array of social skills. He then moved on to be trained by deviant peers in covert skills. He was arrested before the age of 14 years. The likelihood of adult arrest (from 18 through age 23 years) was .65. The second path began in childhood, with average to low levels of overt antisocial behavior and a relatively marginal level of social skills. As a late-onset group, they become involved with deviant peers in midadolescence. There is the expected increase in covert forms. Most of them desist offending. The third group (marginal-isolate), demonstrate only overt antisocial behavior, predicting juvenile and adult noninvolvement in delinquency.

Loeber and his colleagues (Loeber & Farrington, 2000) have also developed a model that describes three paths to delinquent outcomes. Their overt path is thought to begin in childhood with the advent of minor bullying and aggression. The assumption is that over time, the individual progresses to more extreme behaviors such as fighting and then later strong-arm attacks. The second path, covert antisocial behavior, may also begin in childhood, when it might include relatively minor forms such as lying, truancy, stealing in the home, and vandalism. However, younger performers may also engage in fire setting and shoplifting. In adolescence, the more extreme forms may include substance abuse and health-risking sexual behavior and burglary. The third path, authority conflict, begins with noncompliance and defiance, escalating to running away and truancy. Being on this path increases the risk of also moving along the other paths. The average age for involvement in serious delinquency was found to be 11.9 years. Initiation and maintenance on any or all of the paths are thought to be determined by a combination of 41 risk variables described by Loeber and Farrington.

Whether one takes a simple frequency approach to studying antisocial behavior in children and adolescents or focuses on sequential progressions based on developmental data, it is helpful to consider the ecology within which the behavior emerges and grows. Investigators have found repeatedly that entering in predictors can be useful for improving the understanding of developmental processes and for making critical distinctions in the forms of antisocial

behavior. For example, Poulin and Boivin (2000a) found that proactive aggression was predicted by deviant peer involvement, whereas reactive aggression in middle childhood was not. Moreover, Patterson (1993) found that coercive discipline and associated family management practices accounted for the initial and chronic levels of problem behavior, and peer deviance accounted for growth in problem behavior, mostly in adolescence. An empirical account of antisocial behavior must address the fact that it changes form with development. Furthermore, the mechanisms that produce the changes vary from one form to the other, as do the agents and settings in which the changes occur. In a very real sense, this developmental model shows heterotypic continuity (Cicchetti, 1990). We propose that a functional perspective on social behavior and socialization provides an account of the timing and developmental variation observed in various forms of overt and covert behaviors. For this reason, we review literature about the onset, duration, and course of antisocial behavior as a critical foundation for explanation and, more important, intervention.

THE ECOLOGY

As the science of development and psychopathology matures, one sees clearly the need for integration of various levels of analysis, from biological influences, to microsocial analyses of relationship dynamics, to the study of context, including neighborhoods, schools, and communities. An ecological framework is helpful for organizing these levels of analysis (Bronfenbrenner, 1979, 1989).

The basic tenet of an ecological framework is that adaptation is functional. Our emphasis on social interaction patterns narrows the search to focus on functional dynamics in close relationships that elicit and/or maintain antisocial behavior in children and adolescents. We see the antisocial pattern as functional on at least three time scales. First, the overt antisocial behaviors we described earlier are functional at the microsocial level, in that they effectively control behavior. There seem to be two different mechanisms associated with producing immediate short-term control over the behavior of the other person. The first one identified in our observation studies followed an "escape-conditioning sequence": During a conflict bout, the child's persistent or escalating aversive reactions are followed by the other person terminating the bout; for example, the child wins. The other mechanism, and one we frequently encounter in our videotapes of Norwegian families, fits an "avoidance-conditioning model." If a child's demands are not met, the child will punish the parents by having a temper tantrum; the parents avoid the temper tantrums by immediately complying with all child demands. Yelling, screaming, profanity, hitting, slander, and psychological assault become tools of microsocial coercive interactions. They are learned implicitly, forming the grammar of family life.

At a longer time scale, but still microsocial, is the role of deviance in forming the glue of friendships. Friendships are unique in the preponderance of positive behaviors. Indeed, when deviance is functional for keeping a relationship together, it remains a primary "shopping" strategy (Patterson, Reid, et al., 1992). Thus, the time scale is both seconds (probably at the very beginning of new friendships) to months and years (Dishion & Owen, 2002). We call this a "deviant friendship process," or deviancy training for short. The functional time scale may be extended somewhat further as we speculate about the probable function of the deviant peer group in promoting sexual relationships and contexts for early selection of sexual partners (Capaldi & Crosby, 1997; Dishion, Poulin, & Medici Skaggs, 2000; French & Dishion, 2003).

A key assumption of a functional emphasis on social interaction is that thoughts and feelings about relationships may or may not accurately reflect the actual relationship dynamics as revealed through observation analysis (Patterson & Reid, 1984; Patterson, Reid, et al., 1992). Parents referred to clinical settings with a problem child rarely identify their own reaction patterns as part of the problem. Youth are often unaware that their friends are moving them toward behaviors and decisions that will certainly undermine their health and development. Individuals feel their way through the social world, "choosing" responses that avoid or result in punishment. In this sense, consistent with several developmental theorists, relationships define the proximal environment in which change and development transpire (Bronfenbrenner, 1989; Hinde, 1989; Patterson, 1982).

As we shall see, the evidence is compelling that relationship dynamics are part of the problem, but more important, they are critical to the solution in child and adolescent antisocial behavior. Understanding the family and peer relationship dynamics is fundamental to understanding why some interventions intended to reduce antisocial behavior work and others do not (Dishion & Stormshak, in press).

There is a compelling sense, however, in which individuals shape their own futures. An individual can become aware of problematic relationships and dynamics and work to change or avoid those dynamics or reduce their influ-

ence. Individuals clearly shape, manipulate, select, and plan their own futures and avoid pitfalls and take advantage of opportunities to realize goals. This ability to regulate oneself in the social world would seem to increase with age. The ability to do so would be considered a resiliency factor, and the opposite, the inability to resist pressures for deviance and/or addiction, a vulnerability.

Our group has had some difficulty in measuring a construct that reflects individual-level resilience that is not empirically redundant to the antisocial construct. For example, when we formed a multiagent and multimethod construct of competence, we found it correlated −.85 with a similarly formed composite measure of antisocial behavior (Patterson, Reid, et al., 1992). We concluded that the global ratings we used to define children's competence and antisocial behavior were simply positive and negative items on a single "good/bad" dimension. Psychometrically, there is a strong tendency for rating individuals, to reduce one's judgments to the least common denominator, which is simply whether the person is liked or disliked (i.e., good or bad; C. E. Osgood, 1962). This fundamental tendency in rater bias is what underlies the validity problem known as monomethod bias (Cook & Campbell, 1979). Another, less technical term for this is what we refer to as the "glop" problem (Bank, Dishion, Skinner, & Patterson, 1990).

The best strategy for avoiding glop is to become more focused and microsocial when measuring a construct (Fiske, 1986, 1987). In the past decade, progress has been made in linking genetic, brain, and behavioral dimensions to define competence as a process of self-regulation (see Rothbart & Posner, Chapter 11, this *Handbook*, Volume 2). In this chapter, we integrate this emerging literature to discuss the possible role of self-regulation in the development of antisocial behavior. Consistent with a social interaction perspective, we assume that self-regulation is highly embedded in relationship dynamics, consisting of a set of behaviors such as turn taking and listening to others. At another level (and temporal scale), it involves following through on tasks, avoiding situations where the temptation to engage in deviant behavior would be too great, controlling how one thinks and feels about things, and planning ahead. These self-regulatory skills are also those often emphasized in effective interventions for reducing antisocial behavior in children (Dishion & Kavanagh, 2003; Dishion & Stormshak, in press; Kazdin, Siegel, & Bass, 1992; Lochman, Barry, & Pardini, 2003; Lochman & Wells, 1996). Self-regulation, therefore, is the most promising candidate for linking individual characteristics to the ecology in a way that will be helpful in understanding the development of antisocial behavior.

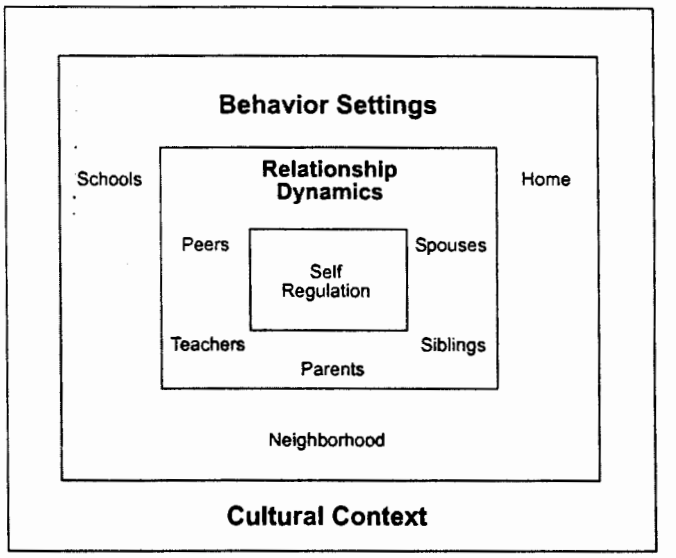

Figure 13.5 The ecology of antisocial behavior.

As shown in Figure 13.5, we invoke three broad domains of constructs to explain the age of onset and severity of antisocial behavior:

1. Relationship dynamics focuses primarily on interactions with parents, siblings, and peers as the proximal training ground for the learning and maintenance of antisocial behavior from childhood through adulthood. Such dynamics are studied by conducting microsocial analyses of interactive dynamics and contingencies, cognition and emotion.
2. Behavior setting stimuli describe the characteristics of contexts to the structuring of relationships that influence problem behavior. Because peer interactions are so important in the development of antisocial behavior, we focus our attention on the public school setting and the formation of peer interactions in children and adolescents.
3. Self-regulation describes the individual's ability to become self-directed with respect to managing daily, weekly, and monthly routines, regulating emotions, keeping in check dysfunctional thinking, and selecting environments conducive to goal-directed behavior.

In addition to these three domains, Figure 13.5 adds the cultural and community context as a conditional variable when considering the viability of an explanatory model. In the past 10 years, a variety of studies have shown variations in dynamics associated with the etiology of antisocial behavior as a function of culture and ethnicity. We address these issues as they pertain to each of the domains reviewed next.

As mentioned, we propose a single model for the development of antisocial behavior that has the potential to be a general application and is relevant to the systematic effort to treat and prevent problem behavior in children and adolescents. We begin with a detailed discussion of relationship dynamics.

Relationship Dynamics

Regardless of theoretical perspective, it is generally agreed that in childhood and adolescent relationships with parents, siblings, peers, and teachers are the basic social ecologies within which antisocial behavior is displayed, practiced, learned, accelerated, or suppressed. During late adolescence and early adulthood, romantic relationships transform into long-term commitments and families; peers become coworkers; authority figures gradually change from teachers to supervisors.

The contribution of parents and peers to the development and course of antisocial behavior can be seen as a layered process that begins in infancy and proceeds through adolescence (see Figure 13.6). From a social interactional perspective (Reid, Patterson, & Snyder, 2002), child socialization is an effortful process that requires adult attention, effort, and skills in managing the minutiae of daily parent-child interaction, as well as the proactive structuring of children's development trajectories. The layers of influence in the socialization process can be seen as hierarchical integration.

The earliest relationship is that of the caregiver and child. Both behaviorists and attachment theorists agree in emphasizing the key role played by the variable *caregiver responsivity* (Patterson & Fisher, 2002). As measured by Martin (1981) and Maccoby (1992) and replicated by Shaw and Winslow (1997), the variable emphasizes maternal sensitivity and warmth in reacting to infant behavior. What gradually emerges are two general dimensions that describe the parenting domain. One dimension can be characterized as affective in that it emphasizes warmth and relational characteristics. The other dimension can be characterized as contingent/noncontingent; for example, the warm relational parent who is also noncontingent (permissive) is likely to produce an aggressive child, as shown by Baumrind (1971). The coercion model emphasizes the noncontingent parent with only weak relational ties to the child.

Caregiver skills in behavior management (i.e., social and material contingencies) build on the caregiver relationship. Attachment is viewed as a necessary, but not sufficient, precondition for socialization to occur. The child must learn to adapt to the intricate network of implicit and explicit rules that govern behavior and that vary as a function of age and gender.

Figure 13.6 shows that parent relationships influence, and, in turn are altered by, parent-guided socialization. For example, obvious failures to socialize the child are received by the parent as negative feedback and alter several components of the parent-child relationship. A study of the OYS sample showed that school failure was highly correlated with measures of maternal rejection (Patterson, 1986). In turn, both of these areas of activity are bidirectionally related to what transpires in interactions with peers. The sections that follow trace out the details of this interconnected aspect of the socialization process as they unfold over the time course between early childhood and late adolescence.

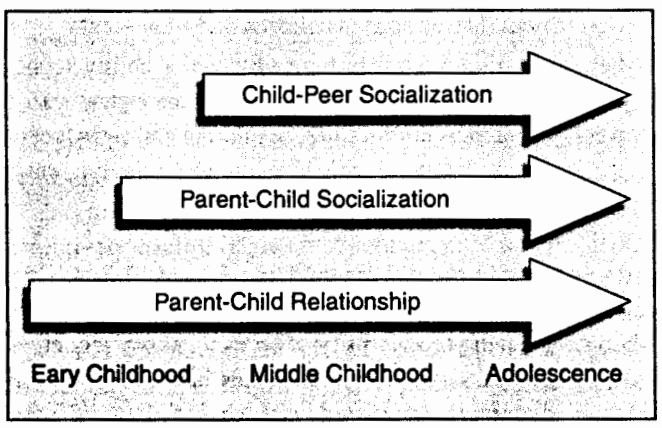

Figure 13.6 Relationship dynamics from early childhood to adolescence.

Parenting Practices

The interest in the relationship between parenting and the development of antisocial behavior cuts across disciplines. In longitudinal studies seeking to predict male adolescent antisocial behavior, parenting practices were among the most powerful predictors (Loeber & Dishion, 1983). Although the general relationship is well established, there is variability from study to study in the magnitude of predictive validity, primarily because of differences in the measurement procedures used to define parenting. Use of parents' recall or reconstruction of their parenting behavior tends to produce lower predictability (Brook, Whiteman, Gordon, & Cohen, 1986; Patterson & Bank, 1986). Children's reports of parenting practices lead to somewhat higher predictive validity (e.g., Nye, 1958; Slocum & Stone, 1965). Outside sources for information about par-

enting, whether from official records of parent criminality, home visitor ratings, or direct observations, consistently produce the highest level of predictive validity for current and future antisocial behavior.

Patterson's (1982) coercion model focused specifically on the contributions of parent-child interactions to child antisocial behavior. This social interaction model implies an emphasis on parent-child exchanges as the proximal cause of antisocial behavior throughout the life span. Even in this early model, parental cognitions were thought to play a significant role. For example, it was hypothesized that during conflict episodes, both parent negative attributions and anger contributed to the likelihood of escalation. A series of laboratory studies showed that parents of aggressive children tended to be overly inclusive in their definitions of deviant child behavior (Patterson, Reid, et al., 1992). Child behaviors classified by trained observers as within normal range were classified as deviant by parents of problem children. It was assumed that these laboratory measures of parent negative attributions could serve as predictors for disruptions in parental discipline practices.

In keeping with this prediction, Nix et al. (1999) found a low-level path coefficient showing covariation between maternal negative attributions to (teacher- and peer-defined) school aggression constructs. However, as shown in Figure 13.7, the path from parent attributions to school aggression was mediated by parent discipline practices. Snyder, Cramer, Afrank, and Patterson (2005) replicated this mediational model. Social cognitions play a powerful role in disrupting parental discipline practices. However, it is the disciplinary exchanges themselves that function as a direct effects model for overt forms of child aggression. In a later section, we examine findings that show an even more dramatic role for maternal social cognitions in understanding future growth in aggression.

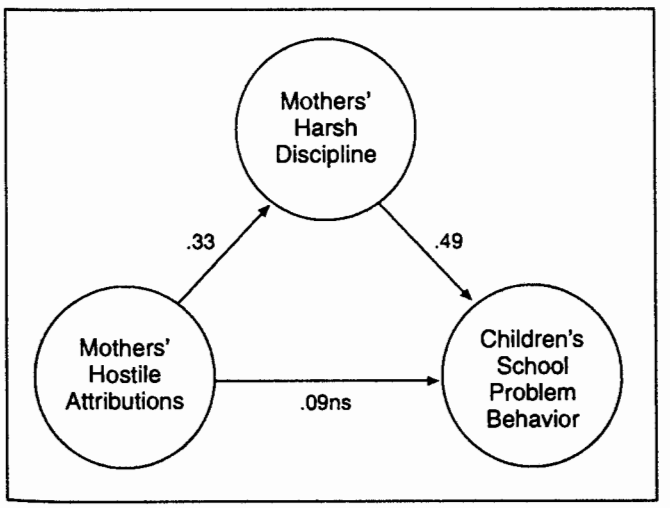

Figure 13.7 Maternal hostile attributions in the coercion cycle. Adapted from Nix et. al. 1999.

To date, the chief focus of the coercion model has been on the process by which the child learns antisocial behavior within parent-child and sibling-child exchanges. The concept of negative reinforcement is the key to understanding the interaction patterns we see occurring between parents and antisocial children, even in the toddler and preschool years. Such interactions occur at some level in all families from time to time. A high rate of coercive exchanges, however, is hypothesized to train children to use a wide range of coercive behaviors in their effort to shape their social environment.

An important corollary of a coercive parent-child relationship is the concomitant reduction in the adult's attention to the child's development of self-regulation, critical to a variety of prosocial skills (Eisenberg & Fabes, 1998). Again, we do not know which comes first: Does the coercive child behavior cause the shutdown in skill development? Or is it the reduced level of positive parent involvement that sets the stage for the development of coercion? The result is clear and dramatic: It produces long-term outcomes such as failure to acquire homework skills, failure to care for or understand others' thoughts and feelings (empathy), and failure to engage in organized games or group activities. In this fashion, the problem child is doubly handicapped.

Coercion is not only about aggression; it also accounts for general tendencies to avoid and, eventually, conceal and manipulate. The child learns to avoid parent demands through a process of negative reinforcement. Repeated over thousands of trials, the child learns to use coercive behaviors to gain control over a disrupted, chaotic, or unpleasant family environment. In these families, aversive events occur as often as one event every 3 minutes. A conflict bout occurs about once every 16 minutes. Given intensive practice, these coercive patterns become overlearned and automatic. This is contrary to the position taken by Bandura (1989, p. 88) in his influential statement, "Because outcomes effect behavior largely through the mediation of thought, consequences alone often produce little change in behavior." Alternatively, the present writers assume that coercive contingencies operate without conscious, cognitive control. In point of fact, the Nix et al. (1999), Snyder, Cramer, et al. (2005), and Snyder, Schrepferman, et al. (2005) studies show that the impact of cognitions on behavior is mediated by contingencies rather than the other way

around. One of the major goals in interventions targeting parenting practices is to help the parent become aware of these automatic patterns and to bring them under more cognitive control (Forgatch & Patterson, 1989).

In the absence of countervailing forces, children may increase the frequency of coercive behaviors, and this, in turn, predicts their moving toward the more severe forms for their age group (e.g., to temper tantrums and physical attacks). As suggested, the coercion process is often not recognized by the participants. Family explanations evolve that suggest that if the child is stubborn (like his or her father?), the marriage is bad, work is interfering, or the school is unfair. We have often found that parent reports about what they are doing yield low predictive validities (Capaldi & Patterson, 1989). The development of observational methodology to record objectively the moment-by-moment interchanges between parents and their children has been critical in evaluating the coercion model. In the OYS, Patterson, Reid, et al. (1992) compared behavior observations and parent interview measures of discipline practices. They found that the correlations between these were low (correlations in the .2 to .3 range), barely satisfying the minimal requirements of convergent validity in construct validation.

The careful longitudinal studies by Shaw and his colleagues (2003) trace out the details for the continuity between toddler and middle childhood status. Toddlers who are low in self-regulation (for their age) and mothers who are depressed are most at risk for engaging in an extended version of the coercion process, accounting for the majority of the children entering elementary school with behavior problems (Shaw et al., 2003). Left on their own, these parents are least likely to improve their parenting practices to the normal range during their child's adolescent. Patterson and colleagues (Patterson & Dishion, 1985; Patterson & Stouthamer-Loeber, 1984) found an association between inept parent discipline practices, parent monitoring, and child antisocial behavior in midadolescence. Thus, cumulative continuity (Caspi, Bem, & Elder, 1989) takes its toll by rendering a very antisocial and violence-prone adolescent (Capaldi & Patterson, 1991; Lykken, 1993).

The issue of whether coercion applies across cultural and ethnic groups is a bit more complex. It certainly is true that parenting practices covary with problem behavior for children across ethnic groups (Catalano et al., 1992; Deater-Deckard & Dodge, 1997; Dishion & Bullock, 2001; Mason, Cauce, Gonzales, & Hiraga, 1996; Steinberg, Dornbusch, & Brown, 1992). There are important differences, however, in the precise form that the coercion process may take across cultural groups. For example, in the recent work by Deater-Deckard and Dodge, reports of physical spanking were correlated with lower rates of problem behavior among European American children but not with African American youth. We used direct observations to compare high-risk and successful early adolescents in the context of their family (Dishion & Bullock, 2001). When we looked at direct observations of specific parenting practices, such as limit setting and relationship quality, there were anomalies in the findings. For example, relationship quality was quite high in the observations of high-risk African American boys with their parent(s), whereas it was less so for successful African American youth and their parents. Moreover, limit-setting practices were rated as lower for successful African American youth, compared to high-risk African American youth. When using an aggregate family management score based on the 45 minutes of direct observation, we found that the ethnic differences dissolved, and only the differences between high-risk and successful remained. These findings underscore the assertion that to measure parenting well, it is important to consider the pattern of contingencies surrounding the performance of positive, neutral, and negative behavior, and that even global ratings of direct observations are vulnerable to biases and obfuscation (Yasui, Dishion, & Dorham, in press). A final point is that interventions that target family management work equally well for all ethnic groups (Connell, Dishion, & Deater-Deckard, in press; Dishion, Nelson, & Kavanagh, 2003; Gross et al., 2003; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 1998).

As children move into adolescence, monitoring becomes an increasingly important aspect of parenting. Patterson and Dishion (1985) found a strong correlation between parent monitoring practices, adolescent delinquent behavior, and deviant peer associations. Inadequate parent monitoring seems to be important in the emergence and maintenance of antisocial behavior in children from middle childhood through adolescence.

Rowe (1994) and Harris (1998) reviewed the findings from twin and adoption studies designed to test for the relative contributions of genes and environments to phenotypic behaviors such as aggression. They concluded that there was no support for the contribution of shared environments to the development of any phenotypic behavior, including children's aggression. They also concluded there was no evidence for the contribution of parenting practices to child aggression. If anything, the evidence indicated that it was the child's behavior that governed parenting practices. There are at least three well-known flaws in the behavior genetics approach that would normally give pause to anyone making such strong claims. The flaws were re-

viewed in detail by Bronfenbrenner and Ceci (1994) and Collins, Everitt, Robbins, Roberts, and Wilkinson (2000). The most salient problems are these:

1. The range is restricted, as shown by Stoolmiller (1998) and by Turkheimer (1991). This is a problem for both adoption and twin designs. Both strategies employ truncated environments, and as a result, the chances of finding environmental effects are severely curtailed.
2. It is the twin design studies that fail to find any effects for shared environments or for parenting practices. There are now three major studies that show that identical twins share an environment that significantly increases their similarity (Carey, 1992; Rose & Kaprio, 1987; Tambs, Harris, & Magnus, 1995). This means that the heritability equation 2 (monozygotic-dizygotic) is confounded.
3. The estimate of heritability varies widely as a function of method of measurement. After reviewing 24 studies, Miles and Carey (1997) concluded that the most salient finding was that estimates of heritability varied as a function of method of measurement. Estimates based on parent ratings tended to show high values for heritability, whereas those based on observation data were very low. These conclusions were supported by two more recent studies by Leve, Winebarger, Fagot, Reid, and Goldsmith (1998) and Deater-Deckard (2000).

In reacting to the Rowe-Harris claims, developmental psychologists such as Collins et al. (2000) took the position that the strongest test of the parenting practices model would be an experiment in which families were randomly assigned to experimental and comparison groups. The experimental group would receive parent management training and the comparison group would not. The design would require data showing significant improvements in parenting skills for families in the experimental group, but not in the comparison group. Furthermore, the data must show improvements in child outcomes for the experimental group but not for the comparison group. Finally, the magnitude of change in parenting must covary with the magnitude of change in child outcomes.

The study by Dishion and Kavanagh (2003) was one of the first to fulfill the demands for an effective experiment. They randomly assigned parents of 150 problematic early adolescents (males and females) to the Adolescent Transitions Program (ATP) or to a nontreatment control group. ATP consisted of three versions of intervention: parent-focused training, teen-focused training, and a joint focus on parent and teen. Involvement in ATP was associated with reductions in parent-child observed negative engagement, which, in turn, were reliability correlated with reductions in teacher ratings of antisocial behavior in school. More recently, Dishion, Bullock, and Granic (2002) found that random assignment to family-centered interventions reduced deviant peer involvement and adolescent substance use (Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002). An analysis of direct observation of parent monitoring practices revealed that changes in parent monitoring where associated with changes in deviant peer involvement and substance use.

The most careful mediation analyses to date are those conducted and reported by Forgatch and colleagues studying children undergoing divorce. The researchers documented that random assignment to parenting interventions showed significant increases in effective discipline and monitoring and in measures of positive parenting, and produced parent-child coercion, which, in turn, was associated with reductions in child antisocial behavior (Martinez & Forgatch, 2001). These changes were associated further with significant improvements in child antisocial behavior, delinquency, and school achievement (Forgatch & DeGarmo, 1999, 2002). It is important to note that the evaluation of these intervention studies carefully selected independent and objective indices of behavior (not parents' report) to minimize the Hawthorn effect on global ratings of functioning.

Attachment and Positive Parenting

As noted earlier, there are impressive areas of agreement between attachment and coercion theories (Patterson & Fisher, 2002). Both theories agree on the fundamental importance of parental responsiveness as being a necessary condition for socialization. Both theories define parental responsiveness as the contingent actions of the parent in reacting to the child. Both the attachment theorists (Van den Boom, 1994) and the behavioral approaches (Martin, 1981; Shaw & Winslow, 1997) predict the association between noncontingent parenting and infant distress. Both would see the impact of contextual factors, such as maternal depression, leading to negative child outcomes as mediated by disruptions in parental responsiveness.

As pointed out in Patterson and Fisher (2002), the two theories differ dramatically in their explanations of the means by which parental responsiveness produces child outcomes. In the behavioral view, the contingent reactions shape both the child outcomes and parent behavior. Some of the literature relevant to this assumption is reviewed in a later section. Attachment theorists (Ainsworth, 1989;

Ainsworth & Bowlby, 1991; Rutter, 1995) take the position that the impact of parental responsiveness on child outcome is entirely mediated by mechanisms such as infant level of attachment, the child's internalization of parental values and standards, and the child's attributions. The brief review by Fagot and Kavanagh (1991) suggested only limited predictability from attachment classification to child adjustment for males but not for females and for at-risk families, rather than for normal families. It can be said that in terms of variance accounted for, attachment theory makes only a limited contribution.

Although both theories agree in their emphasis on the importance of parental positivity on child outcomes, the empirical findings testing these assumptions pose an interesting problem for both theories. When we constructed multimethod, multiagent indicators for a range of child deviant and prosocial behaviors, our correlational models showed a very interesting pattern of findings (Patterson, Reid, et al., 1992, see Table 5.7). As expected, when examining antisocial outcomes, the measures of disrupted parenting (monitor and discipline) accounted, on average, for about 16% of the variance, and measures of positive parenting accounted, on average, for about 3%. We had expected that models built to account for prosocial outcomes such as achievement, self-esteem, and peer relationships would show the reverse pattern. Our best attempts to specify parent involvement, parent support, and dyadic problem solving produced significant correlations with child achievement, but on average, they accounted for only about 3% of the variance. The results were disappointing and lead us to believe that perhaps we did not focus enough on specifying the measurement models for positive parenting.

We were surprised to find that the measures of disrupted monitoring and discipline seemed to predict both negative and prosocial outcomes. They accounted for about 3 times as much variance as did measures of positive parenting! The findings suggest the interesting possibility that when the coercion process is well under way, one of the most important concomitants is a shutdown of all prosocial support mechanisms. If the family is extremely coercive, it is known that there is little reinforcement or support for prosocial activities. The amount of support for prosocial behavior is entirely a function of the level of pathology. If this is true, then an experiment should show that reducing coercion levels would be accompanied but a sudden increase in the relative contribution of parent support, parent involvement, and problem solving.

Some recent findings from prevention studies are of particular interest because they seem to support such an idea. The data from a randomized prevention trial showed that growth in parent positivity (support, involvement, problem solving) played a dominant role in bringing about change in child compliance behaviors (Martinez & Forgatch, 2001). The path coefficient from growth in positive parenting to changes in child compliance was −.54. The comparable path for improvements in discipline and growth in compliance was also significant, but a much lower .19. A single study is hardly creditable, but the findings set the question in proper perspective. What does positive parenting contribute to the process of change?

F. E. M. Gardner (1989) made significant progress on this scientific issue. She asserts that it is necessary not only to look at the immediate reaction of compliance or noncompliance, but also to consider the outcome of the conflict minutes afterward. Using this approach, she found that mothers of conduct problem children were 8 times more likely to relinquish demands than mothers of normal children. Also, mothers of nonproblem children handled 43% of the conflict episodes inconsistently, compared with 5% of mothers of normal children.

Another criticism by F. E. M. Gardner (in press) of the coercion model is that it is too clinically oriented and does not fully consider the causal impact of positive features of the family environment. In coercion theory, it is the use of aversive exchanges, rather than positive exchanges that disrupts child development. In her observation, the more entrenched the parents become in the coercion process, the further they shrink from relationship skills that they would enjoy under more favorable circumstances.

F. E. M. Gardner (in press) went on to isolate deficits in positive interactions that characterize families with antisocial children. She found that proactive parenting, in particular, differentiated parent-child interactions of conduct problem and normal children. This parenting skill involves a combination of structuring situations to avoid misbehavior, engaging the child in positive, joint activities, and using verbal prompts that elicit positive behavior in children. Although these positive practices may be disrupted because of the coercion process, the lack of proactive parenting may have a unique effect on multiple aspects of child social development not predicted by coercive interactions.

Patterson (1986) tested a structural equation model that demonstrated a strong correlation between harsh, abrasive, and inconsistent parent discipline and child antisocial behavior. This model was replicated across the two cohorts of the OYS with a single-parent sample and a clinical sample (Forgatch, 1991). The longitudinal studies by Shaw and colleagues (1998) demonstrated that these processes are in

place at a very early age. Their models combine both a contingency and an attachment view and use it to account for the emergence of behavior problems in early childhood. To measure the attachment relationship, however, they did not use the Strange Situation task, but innovated a process measure. They employed an innovative highchair task pioneered by Martin (1981) to measure parents' responsiveness to the child. Shaw and colleagues found that the lack of parent responsiveness in infancy combined to account for variation in antisocial behavior.

These variables interact to account for the very early emergence of behavior problems (Shaw, Keenan, & Vondra, 1994). The study showed that child noncompliance and mother's nonresponsiveness combined to predict overall levels of aggression by age 24 months. Moreover, at 24 months, an aggression-by-maternal-nonresponsiveness interaction term predicted overall levels of aggression by age 36 months. As the longitudinal study proceeded, rejecting parenting was added to the prediction equation. Rejecting parenting at 24 months predicted the highest rates of aggressive behavior by age 4 (Shaw et al., 1998). Levels of marital conflict were also highly correlated with rejecting parenting (Shaw, Winslow, & Flanagan, 1999), which combined to account for behavior problems by age 5. Ingoldsby, Shaw, and Garcia (2001) followed the sample into school, finding that the pervasiveness of family conflict predicted aggression with peers at school. Most recently, using a trajectory analysis approach to analyze their longitudinal data, Shaw and colleagues (2003) found that children with low levels of self-regulation (in this case, inhibitory control), who also had depressed mothers, were most likely to be aggressive as toddlers and to continue on the antisocial trajectory to the second grade of elementary school.

Most investigators working in this area feel that the parenting model can be strengthened. For example, F. E. M. Gardner's work suggests the importance of identifying proactive parenting skills, and Shaw's work reveals the unique role of parents' responsiveness in toddlerhood to socialization.

The groundbreaking studies by Nix et al. (1999) and Snyder, Cramer, et al. (2005) dramatically expand the model by integrating parenting variables with measures of parental attribution. In this area, there are also studies by Stoolmiller and Snyder (2004) that stitch together models for emotion with models for parenting. There is one more dimension to this struggle that should be noted: A study by Forgatch, Patterson, and Ray (1996) showed that the parenting models that adequately described individual differences in aggression did not fit when applied to growth data for aggression. Patterson (1993) also found that the model that explained intercept values for antisocial behavior did not fit in models for growth in antisocial behavior. Different models were also required for intercept and growth models of delinquency.

It seems, then, that we may require one parenting model to explain individual differences in aggression but a quite different one for modeling growth in antisocial behavior. In keeping with this distinction, Snyder, Cramer, et al. (2005) found that discipline practices did not contribute to measures of growth assessed at home or school. However, a product term (discipline) by mother (negative attribution) was a significant predictor for growth in both settings.

In summary, there is little doubt that parenting practices are highly correlated with child antisocial behavior. It is also the case that improvements in parenting practices during well-designed intervention studies produce decreases in a child's antisocial behavior. The strength of these findings and the fact that they are replicated means that we can now set about the task of improving the models.

Siblings

It has been said that siblings are no more alike than two people chosen at random (Plomin & Daniels, 1987). It turns out that method variance again distorts our view of the contribution of siblings (Hoffman, 1991); that is, the lack of similarity among siblings ($r = .16$) found across samples may be an artifact of data based on personality inventories. Research employing alternative assessment methods, including direct observation, paints a different picture of similarity between siblings on several indices of adaptation in the home and school settings in the middle childhood years. It turns out that when effective measures are employed across siblings, there is a robust correlation for aggression.

Studies that attempt to disentangle the influence of different family agents on the socialization of the child and the development of antisocial behavior are just beginning. Considerable evidence suggests that the influence of siblings is significant. One recalls the finding, first reported by West and Farrington (1973), that 5% of the families accounted for 50% of the crimes in an urban London sample. This finding implied that siblings share a common trait for antisocial behavior. We suspect that siblings are fellow travelers on the path to antisocial behavior (Patterson, 1986).

Clinical experience tells us that children referred for conduct problems often differ little from their nonreferred siblings. In their home, siblings' rates of aversive behavior

frequently are comparable to that of the target child. Patterson (1986) reported a correlation of .61 among brothers referred for conduct problems who were observed in the home. Patterson, Dishion, and Bank (1984) found a correlation of .43 among boys and their siblings as observed in the home. Patterson (1984) proposed that siblings, as well as other family members, shared a mutual trait toward aggressiveness. The thought is that the coercion process, as previously discussed, is elicited by inept parenting practices (Patterson, 1982; Patterson, Reid, et al., 1992) and has an impact on all members of a family system.

Strong support for the parenting hypothesis was provided in an intervention study reported by Arnold, Levine, and Patterson (1975). In a reanalysis of clinical cases seen for child aggressive behavior, they found that all siblings decreased observed aversive behavior following parent training, even though only the problem child was targeted for treatment. However, the high correlations between siblings on observed aggressive behavior are confounded because siblings are most often interacting with each other when observed in the home. The finding also needs to be replicated with a randomly assigned experimental control group.

There is some evidence for sibling similarity outside the home. For example, the work of Lewin, Hops, Davis, and Dishion (1993) showed convergence among siblings on such measures as negative peer nominations ($r = .65$), teacher ratings on aggression ($r = .48$), and observed positive peer behavior in the classroom ($r = .47$). The correlation among siblings in teachers' reactions to each child in separate classrooms was surprising. Behavior observations in the classroom revealed a correlation of .72 ($p < .001$) in observed teacher disapproval. Note that these were independent observations of each of the siblings in separate classrooms with different teachers.

A simple generalization model cannot account for siblings' similarity in the school setting. Although siblings' behavior in school is intercorrelated, as is siblings' behavior in the home, two studies showed that there is not a high correlation between children's aversive exchanges with their siblings and their peer acceptance of antisocial behavior in school (Abramovitch, Carter, Pepler, & Stanhope, 1986; Dishion, 1987). Bank and Burraston (2001) also showed that sibling conflicts in the home were a poor predictor for deviant peer contacts in the school.

Aside from the contribution of siblings to the coercion process, there is recent evidence that siblings may function to facilitate antisocial behavior by two mechanisms: first, by reinforcing deviant talk and behavior in families, and second, by forming coalitions that undermine parents' ability to socialize young adolescents. The process has been referred to as *sibling collusion* (Bullock & Dishion, 2002). In this study, observers coded videotapes of family interactions of high-risk and normative young adolescents for sibling collusion. We found that sibling collusion was highly correlated with young adolescent problem behavior, as defined by teachers and self-reported, and that this effect held when controlling for involvement with deviant peers. Incidentally, sibling collusion was also highly correlated with the young adolescents' involvement with deviant peers, suggesting yet a third function of siblings, in that older siblings may in fact provide a bridge to the deviant peer group.

In a second study, Stormshak, Comeau, and Shepard (2004) examined the role of sibling "deviancy training" as measured by direct observations without the parents present. Using latent growth modeling, they found that direct observations of sibling deviancy training and their own problem behavior were strongly associated with growth in adolescent problem behavior, even when controlling for the behavior of peers. Of course, in many ways, the contribution of siblings is difficult to study in isolation from peers, as sibling relationships are often embedded within peer networks, especially in adolescence.

More recently, Bullock, Bank, and Burraston (2002) examined the prognostic value of sibling conflict to adult continuance in antisocial behavior. These investigators examined collected expressed emotion indices of sibling negative affectivity and conflict. Compared to earlier measures of home observations of sibling conflict, coded expressed emotion from 5 minutes of audiotaped speech samples predicted long-term patterns in antisocial behavior over and above direct observations of coercive sibling interactions. These data point to the potential importance of the expressed emotion methodology for studying relationship processes and indicate the potential long-term and unique influence of siblings to antisocial behavior.

Peers

It has become increasingly clear that most covert forms of antisocial behavior (proactive aggression, relational aggression, stealing, etc.) are embedded within peer and friendship relationships. In contrast to our previous review, we posit peers as a major proximal cause of antisocial behavior, beginning in early childhood and accelerating in influence during early adolescence.

We see this as being accomplished in three major ways: (1) Antisocial behavior interferes with positive peer relations, depriving children of the positive benefits of peer learning and confining them within the social niches of

marginal adjustment; (2) children may act as models and a source of reinforcement for antisocial behavior; and (3) as children develop friendship networks, support for antisocial behavior is established by providing both reinforcement and opportunity for such behavior. We address each of these issues in turn.

Entry to school may be the first occasion during which the child is exposed to significant numbers of nonrelated age mates (French, 1987) and, as such, provides the conditions for establishing the peer culture. Patterson et al. (1967) have shown that one of the consequences of exposure to other children is an increase in aggression. Their microanalysis of preschool children's interactions revealed that peers provide very rich schedules of positive reinforcement for coercive behavior, with 80% of coercive behavior producing successful outcomes. Instigators and victims are not random: Certain children provide reinforcement for aggression, with the consequence being an increase in the victimization of these children (Olweus, 1979). Snyder, West, Stockemer, Givens, and Almquist-Parks (1996) found that, in Head Start preschools, peer choice and reinforcement were salient predictors of early aggression. Affiliative structures and coalitions seem fundamental to the human condition even in early childhood and are germane to the development of antisocial behavior (Strayer & Santos, 1996). A recent study by Snyder, Schrepferman, et al. (2005), and colleagues revealed that as early as the 1st year of elementary school, peer interactions (i.e., deviancy training; see later discussion) could be identified among children and their classmates that predict escalations in antisocial behavior during the 1st and 2nd years of school. Kellam, Ling, Merisca, Brown, and Ialongo (1998) also find that the level of aggression in children's 1st-year classroom predicts long-term patterns of problem behavior. These reinforced patterns of aggression are common and continue into at least early adolescence. We see the early school maladaptation leading to marginal school adjustment, which amplifies deviant peer affiliation networks, which, in turn, provide a proximal context for the refinement and growth in new forms of problem behavior.

The impact of peers on antisocial behavior is also seen in the work of Dodge, Price, Coie, and Christopoulos (1990). Using data from a series of playgroup sessions involving previously unacquainted peers, they found that 50% of the aggression observed in these play sessions was accounted for by a mere 20% of the dyads. As might be expected, these dyads consisted primarily of members identified by their aggressiveness. This research is complemented by a paper presented by Cillessen (1989), in which it was found that triads of low-status first-grade children were the most highly aggressive; mixed dyads (low and high status) produced considerably lower levels of aggressive behaviors. Thus, the antisocial traits of individuals merge to create a dyadic tendency to engage in antisocial behavior. When both members are antisocial, an amplification of maladaptive characteristics is likely. These data also raise the issue of deviant peer influences as early as middle childhood.

Much of the research on the role of peers in middle childhood antisocial behavior focuses on children's acceptance within the peer group, or sociometric status. Antisocial behavior has emerged as the most consistent correlate of social rejection in children (e.g., Coie & Dodge, 1988; French & Waas, 1987). Aggression is not, however, consistently associated with peer disapproval. Fighting back from a provoked attack may be positively associated with social status (Olweus, 1979), whereas unprovoked attacks seem to be a pathogenic sign of a general antisocial trait. Furthermore, antisocial behavior appears to account for only about 50% of peer rejection in boys (French, 1988) and somewhat less in girls (French, 1990).

The clearest evidence of the impact of aggression comes from observations of playgroups comprising previously unacquainted members. Coie and Kupersmidt (1983) formed playgroups consisting of four boys who differed in status. Rejected boys exhibited more physical and verbal aggression than other group members. Similar findings were obtained by Dodge (1983) in a study of unacquainted groups comprising eight boys unselected by status. Boys who eventually were rejected by their companions exhibited more physical aggression, inappropriate play, and hostile verbalization than other group members. In comparing the role of overt aggression and relational aggression to peer rejection, Crick (1996) found that overt aggression was most correlated with peer dislike.

It is not always true that antisocial behavior is associated with peer dislike. Stormshak et al. (1999) examined the covariation across classrooms between peer social preference and behavior problems. Apparently, some classrooms are settings for peer contagion, as in these, behavior problems lead to positive peer relationships.

The child's movement out of middle childhood into adolescence is marked by increased involvement with peers and affiliations with larger social groups. Much of the research on the contribution of peers to the development of antisocial behavior has focused on the impact of social groups. These are larger than friendship dyads and can be categorized as cliques or crowds (Brown, 1989). Cliques generally consist of fewer than 10 members who frequently

interact with each other. In contrast, crowds are defined on the basis of reputation, and members may or may not interact with each other.

There is evidence that children who are rejected by their peers (a significant percentage of whom exhibit antisocial behavior) begin to associate together during the elementary school years. These children are more likely to interact with younger peers, other rejected children, and individuals with whom they are not friends (Ladd, 1983). These groups become increasingly solidified during early adolescence. Contributing to the formation of these groups is the adolescent quest for autonomy and vulnerability to peer pressure (Steinberg & Silverberg, 1986). An additional factor is the normative transition from the small elementary school environment to the larger, more impersonal middle and high school settings, where there are large numbers of age mates with whom to associate and considerable freedom from adult scrutiny.

Dishion, Patterson, Stoolmiller, and Skinner (1991) found that low parent monitoring, poor academic skills, and peer rejection in middle childhood accounted for associations with deviant peers by early adolescence, even after controlling for prior levels of antisocial behavior. Although the deviant peer construct was stronger at a later age, there was indication that deviant peers were identifiable in the elementary school setting, as reported by children, teachers, and parents (Dishion, 1990). There was respectable stability in involvement with antisocial peers from ages 9 to 10 and 11 to 12, reflected in a standardized beta of .26 ($p < .01$) when controlling for family, school, and the child's behavior at age 9 to 10. Cairns, Cairns, Neckerman, Gest, and Gariepy (1988) found that aggressive children in middle school tended to associate more as a function of mutual attraction than of peer rejection. In addition, Cairns, Cadwallader, and Neckerman (1997) reviewed literature suggesting that adolescent members of gangs are a cast of the formerly ostracized and alienated. We recently established that peer rejection in the 1st year of middle school was a unique predictor of gang affiliation by the end of middle school, controlling for earlier measures of antisocial behavior (Dishion, Nelson, & Yasui, in press). One interpretation of peer aggregation is that children actively select environments that fit their genotype, and that these environments serve as nonshared environmental influences on child and adolescent problem behavior (Harris, 1995; Rowe, Woulbroun, & Gulley, 1994).

A study by Bullock, Deater-Deckard, and Leve (in press) was one of the few behavior genetic studies on deviant peer affiliation conducted using a multiagent and multimethod assessment. This study used a twin study (Leve et al., 1998) to determine heritability of deviant peer affiliation. Multiple ratings of deviant peer affiliation were obtained for monozygotic and dizygotic twins, including direct observations of friendship interactions and two independent teacher ratings (teachers rated siblings and peers independently). The portion of variance attributable to genotype and shared and nonshared environments varied dramatically by assessment method (one measure of teacher ratings yielding the highest heritability). Consistent with previous analyses of this sample, direct observations produce zero heritability coefficients and high shared environmental coefficients. The studies from this sample are critical for our understanding of the methodological barriers to disentangling, unambiguously, nature from nurture on many indices of social development, including deviant peer affiliation.

Association with deviant peers is the strongest predictor of escalating adolescent problem behavior. The large-scale, longitudinal study using a national probability sample reported by Elliott et al. (1985) focused on the role of deviant peers in the etiology of adolescent delinquent behavior. They found that self-reported involvement in a deviant peer group accounted for substantial variance in subsequent levels of self-reported delinquency in middle and late adolescence, even after accounting for previous levels of delinquency. This held for males and females and generalized from minor delinquency to more serious index offenses and serious substance use.

Even more compelling is the work by Thornberry and Krohn (1997) on the influence of gangs on problem behavior. One would think that gangs were simply another form of deviant peer group influence. The important work of Thornberry and Krohn shows that gangs actually contribute to increases in delinquency, after controlling for deviant peer affiliation. Although deviant peer behavior and gang membership are highly correlated, the latter provides independent prediction of problem behavior. This suggests that formation of strong group ties with a verbal label amplifies the influence of deviant peers on behavior. This emerging area of research is very important and, we hope, will lead to further clarity about the possible mechanisms. Kiesner and colleagues (Kiesner, Dishion, & Poulin, 2001) found that identification with a deviant peer group increased the level of influence on future behavior. We discuss later in the chapter the complementary hypothesis that the social interactions within a gang, replete with mutual identification, account for the influence of gangs on problem behavior.

Not only do adolescents who engage in antisocial behavior tend to associate with other antisocial adolescents, but these groups often commit criminal acts. Aultman (1980) carefully reviewed juvenile records in Maryland and found

that 63% of all recorded offenses were committed in the company of two or three peers. Group involvement tended to vary with the type of offense, with 68% of property offenses and 43% of violent offenses committed by groups. Girls were also likely to commit offenses in the company of others, with 57% of their offenses committed in groups. In an analysis of self-reported delinquent acts, Gold (1970) estimated that 75% of all delinquent acts were committed in the company of friends.

The correlations between deviant peer involvement and antisocial behavior were quite high ($r = .40$ to .59) and held when both constructs were measured using multiple methods of measurement for both constructs (Patterson & Dishion, 1985). The relation held when the antisocial trait scores were correlated, based on independent reports, for two boys who were friends. For example, Dishion, Andrews, and Crosby (1995) found a correlation of .42 ($n = 181$) between the OYS boy's antisocial behavior and that of his best friend. The correlation between the boy's substance use was even higher ($r = .52$; Dishion et al., 1995), supportive of the finding reported by Kandel (1986) that attitudes toward substance use tend to be a salient sorter of friendship cliques in early adolescence.

To study the friendship interactions associated with antisocial behavior, OYS boys 13 to 14 years old were asked to bring in their closest friend to complete a 25-minute videotaped problem-solving discussion. Dishion, Andrews, and Crosby (1995) found a tendency for the friendships of antisocial boys to be abrasive, less stable, and less satisfying to the boys themselves. As would be expected from coercion theory, the antisocial boys tended to be bossy with their friends, were involved in negative reciprocal cycles, and developed relationships that tended to end in disharmony within a year.

Since our last writing, we have conducted several studies identifying the mutual influence processes in adolescent friendships that are associated with escalations in substance use (Dishion, Capaldi, Spracklen, & Li, 1995), self-reported delinquency (Dishion et al., 1996), and adolescent violence (Dishion, Eddy, Haas, Li, & Spracklen, 1997). When the videotapes were recoded using a system that captures a process we refer to as deviancy training, the predictive validity of those friendship interactions increased considerably. The process involves a statistically reliable contingency between deviant talk and laughter, analyzed at the level of the dyad. In each of the studies that follow, 25 to 30 minutes of videotape coded for deviancy training was associated with increases in problem behavior, controlling for past behavior. The findings were extended to understanding problem behavior in adolescent girls (Dishion, 2000). Patterson et al. (2000) found that deviant friendship process predicted multiple forms of adult antisocial behavior (arrests, unsafe sexual practices, and substance abuse), controlling for deviant peer association.

As one might suspect, the causal linkage between deviancy training and problem behavior is bidirectional. Dishion and Owen (2002) followed the OYS boys from age 10 through age 24. They found that, as hypothesized, deviant friendship process at age 14 predicted multiple forms of substance use at age 16 years. However, substance use at age 16 invariably predicted selecting deviant friendship process at age 18. Thus, substance use reduced the stability of deviancy training from ages 14 to 18 ($r = .53$, for a 30-minute sample of behavior). We concluded that substance use could also serve as a process for connecting youth to friendship networks and cliques that encourage deviancy training.

Several models have been applied to the direct observation data that assess deviancy training in adolescent friendships. The most exciting to date is the application of a dynamic systems framework to understanding peer influence. In a study conducted by Granic and Dishion (2003), we found that the tendency for some adolescents to engage in deviant talk could be conceptualized as an attractor. In this analysis, it was found that some dyads' deviant talk episodes tended to get longer in duration over the course of the 30-minute observation session. The slope score describing this growth in duration was actually predictive of future adolescent problem behavior, controlling for prior behavior.

One of the advantages of a dynamic systems framework is the use of state-space grids to capture the entire social interaction matrix of a relationship (Lewis, 2000). As shown in Figure 13.8, a state-space grid provides a visual inspection tool for identifying multiple dimensions of relationship dynamics, including attractors, phase transitions, flexibility, rigidity, and the like. We have applied information theory, in general, and the entropy index, in particular, to describe the level of organization in a sequential relationship interaction (Krippendorf, 1986). Low entropy suggests a highly organized interaction process, in that two individuals are moving together in synchrony. High entropy reflects a state of complexity and randomness. In classic thermodynamics, high levels of organization in movement require more energy than randomness. Thus, in general, if relationships are like matter in the universe, there is a tendency toward randomness without effort and attention from the interacting partners. As can be seen in Figure 13.8, both antisocial and normal dyads have low and high entropy scores. In fact, level of entropy was uncorrelated with concurrent problem behavior (Dishion, Nelson, Winter, & Bullock, 2004).

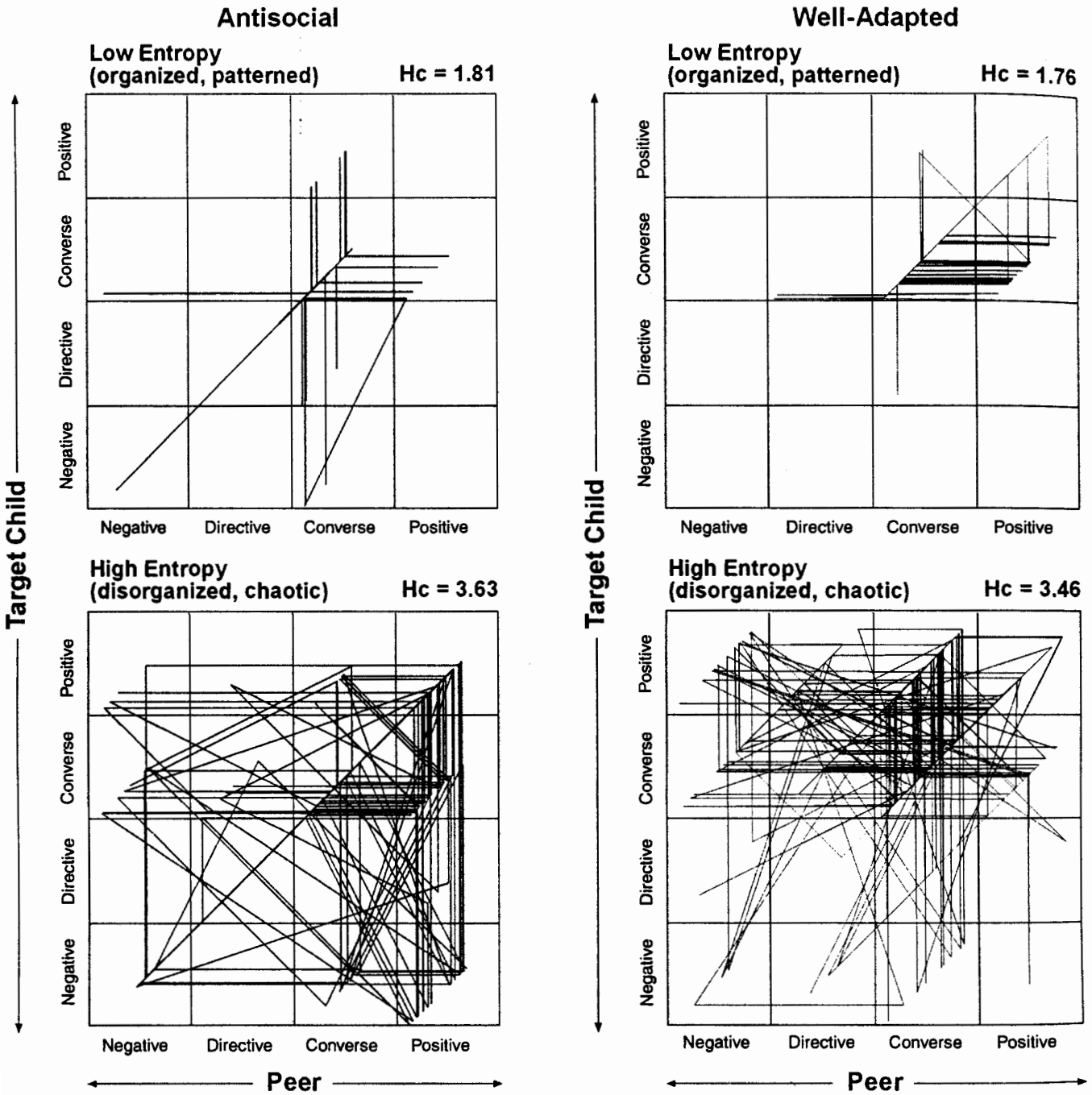

Figure 13.8 Peer process state space grids. Adapted from Dishion, Nelson, et al., 2004.

When following the OYS boys to age 26 and predicting their adult substance use and antisocial behavior, we found that boys with high levels of deviancy training and low entropy scores at age 14 were the most likely to engage in these multiple forms of problem behavior in adulthood. The interaction between the deviancy training and entropy scores was so dramatic that it appeared that the adolescents who organize their relationships around deviance are the most at risk for long-term adjustment process. This is an important finding as it suggests that deviance is an active, constructive process for some individuals, not just a form of arrested socialization.

We recently took the entropy analysis one step further. As mentioned previously, we have had some trouble in trying to measure a construct of competence and social skill that was empirically nonredundant to antisocial behavior.

Dishion and Piehler (2005) recently observed a group of friendship interactions of three groups of adolescents: early-starting persistent, late-starting, and successful youth. In addition to coding deviancy training, as defined earlier, a measure of dyadic mutuality was used as a macro rating of each interaction episode. Mutuality was defined as listening, turn taking, lack of self-centeredness, empathy, and shared understanding. As suspected, as a group, early-starting persistent youth were generally lower on mutuality and highest on deviant talk compared to late-starting and successful youth. Moreover, females were much higher on mutuality than males. What is interesting, however, is that there was an interaction between friendship mutuality and the youths' deviance in predicting problem behavior. Like the entropy finding, youth who were both more mutual and deviant were the most likely to be arrested.

Dyadic mutuality is assumed to be a partial reflection of the youth's ability to self-regulate, with respect to selecting friends with similar values and being able to be skillful in relationship interactions. However, as we see, if a youngster is deviant, this trait may not bode well for his or her long-term outcomes. The measurement of regulation is quite complex and requires adding specific responses to social interactions at its core.

Sophistication in measurement, analytic models, or longitudinal data does not ignore experimentation in establishing causal influence (Cook & Campbell, 1979). One would think that if peers are powerful in their influence on problem behavior, they could potentially be used therapeutically in promoting self-regulation or prosocial behavior. It is interesting, in fact, that despite the widespread aggregation of high-risk youth into programs, interventions, and settings for delivery of therapeutic, educational, and remedial interventions, there are very few studies that show these programs are effective.

In fact, we found that aggregating high-risk young adolescents into cognitive-behavioral interventions to promote prosocial self-regulation actually increased problem behavior. In a randomized trial involving assignment to parent and peer interventions, we found that youth assigned to peer interventions show short-term (Dishion & Andrews, 1995) and long-term increases in self-reported smoking and teacher ratings of problem behavior (Poulin, Dishion, & Burraston, 2001). Negative effects for peer aggregation were indeed attributable to informal interactions among youth in the groups (before and after the session) that were coded as deviancy training (Poulin, Dishion, & Burraston, 2001). Had our study been the only one that documented iatrogenic effects for peer aggregation, we might have accepted these data as anomalous. However, in collaboration with our colleague, Joan McCord, we also found that the 30-year iatrogenic effects of the Cambridge Sommerville Youth Study were, indeed, attributable to the young adolescent boys being sent to summer camps. The odds were 10 to 1 that if a high-risk boy was sent to a summer camp on two consecutive occasions, he was likely to have a 30-year negative outcome compared to his randomly assigned control (Dishion, McCord, & Poulin, 1999).

A repeating theme in this chapter, and in developmental psychopathology in general, is the synergistic relationship between intervention research and developmental research. The random assignment studies showing negative peer effects suggest that peer dynamics are indeed powerfully causal (at least bidirectional causation) with respect to problem behavior in early adolescence. There is a need for a broader ecological view on peer influence, one that incorporates parent and peer influence simultaneously.

Parent-Peer Mesosystem

The challenge to developmental theorists and researchers is to think systemically about the joint influence of multiple relationship contexts on social behavior. Most of the work in this area has considered the joint influence of parents and peers. It is often said that parental influences diminish during adolescence, whereas peer influences increase. Early in the study of antisocial behavior, Robins (1966) found that macro characteristics of children's peer groups, parent characteristics, and school performance, in combination, accounted for a substantial number of subsequent antisocial adolescents. For this reason, it is surprising that more data addressing the joint influence of parents and peers at different developmental stages are not available. Parent-peer models hold the most promise for guiding comprehensive intervention strategies that prevent or reduce antisocial behavior prior to adulthood.

Bronfenbrenner (1979, 1989) refers to such models as *mesosystem* models. A true mesosystem model not only incorporates the additive univariate effects into a multivariate model, thereby explaining variance in antisocial behavior, but it also assesses the interaction between the microsystems. The research reviewed in this section assesses the joint influence of parents and peers on antisocial behavior, as well as the impact of parent and peer systems on each other. Studies that incorporate these developmental questions are also included here.

Based on data collected from families and peer groups in the 1950s and 1960s, Elder (1980) found that adolescents coming from less nurturing, less positive, and less involved parent-child relationships were more likely to

become invested in a deviant peer group and to respond to the deviant group norms with like behaviors. Conversely, children who had close and positive relationships with their parents tended to select values congruent with their parents', which were often prosocial and conventional. These findings suggest that a shift may occur in adolescence, when it becomes ever more critical for parents to maintain and enhance their relationship and involvement with adolescents. Kerr and Stattin (2000) point out that, inadvertently, parents' intrusive efforts to monitor can actually undermine adolescents' willingness to self-disclose. Dishion and McMahon (1998) make a similar point, positing that parent monitoring is based on positive family relationships. Invariably, adolescents involved in problem behavior are less open about their activities than adolescents with nothing to hide, and to this extent, the exchange of information necessary for monitoring is bidirectional.

As children move toward adolescence and spend more time outside direct adult scrutiny, parental monitoring becomes an increasingly important predictor of delinquent behavior. Stoolmiller (1990) referred to this preadolescent behavior as *child wandering,* and this can be added to the list of problematic behaviors exhibited by the persistently antisocial child. Dishion et al. (2000) proposed a premature autonomy mesosystem model, which integrates an evolutionary perspective with learning theory. Adolescence is a time of rapid biosocial change, and these biological changes affect the salience and energy of peer relationships (Spear, 2000). As several ethologists have discussed, adolescence is a developmental period when peer coalitions are critical for facilitating reproduction and survival (Sameroff & Suomi, 1996). Thus, we speculated that deviant peer affiliations were an adaptation of marginalized young adolescents.

We tested the premature autonomy model with a sample of high-risk young adolescent males and females, finding that school maladaptation (peer rejection, behavior problems), poor parent monitoring, and puberty predicted deviant peer affiliation. Deviant peer affiliation and puberty were the strongest predictors of early-onset sexual intercourse and number of partners with whom the adolescents had sex at ages 15 to 16 (Dishion et al., 2000). These findings build on the groundbreaking research of Magnusson, Stattin, and Allen (1985) showing the provocative effect of early female maturation on affiliation with older deviant males. We propose that the same effect is likely to apply to males of marginal social status.

As noted earlier, mediation models seemed appropriate when considering the contribution of parent attributions in parenting models. However, nonlinear moderator models seemed more appropriate when considering growth in antisocial behavior. The distinction also seems particularly appropriate when considering the roles of deviant peers in the socialization process. Latent growth modeling applies structural equation modeling to the analysis of longitudinal data, providing the capability to model both intercept and slope. Patterson (1993) tested a model that accounted for both aspects of child antisocial behavior as measured from fourth to eighth grade. In this model, the boy's relative ranking (i.e., intercept) over the 4-year interval was associated with parenting practices in the fourth grade, as defined by discipline (home observations) and monitoring. Linear growth in antisocial behavior, however, was independently accounted for by two factors: the child's increase in unsupervised wandering and his association with deviant peers. This model is particularly helpful because it points to the synergistic influences of parents and peers on antisocial behavior. Parenting practices account for the boy's antisocial trait, and deviant peers account for the boy's learning new and creative forms of antisocial behavior. The model provides an intuitively appealing picture of the joint influences of parents and peers in the maintenance and course of antisocial behavior in adolescents.

Parent involvement with continuous conflict seems to take its toll, as shown by the longitudinal analyses of the OYS parents (Dishion, Nelson, & Bullock, 2004). The data were collected every other year, consisting of directly observed parents and boys solving problems on videotape. Global ratings were made on the parents' use of family management skills from ages 9 to 18. We compared changes in observed family management for boys defined as early starters and those who were never involved in antisocial behavior. As can be seen in Figure 13.9, there was a slow but significant deteriorating in the practices of parents of antisocial boys. Forgatch and DeGarmo (2002) showed a similar decrease in effective parenting over a 3-year interval for an untreated comparison group of recently divorced mothers.

Next, we examined the joint influence of parent disengagement and observed deviancy training with friends on young adult antisocial behavior (Dishion, Nelson, & Bullock, 2004). As expected, the intercept of family management and deviant friendship process was correlated ($r = -.42$), and the intercept on both constructs negatively predicted growth. It was interesting that the intercept on deviant friendship process predicted parents' disengagement from monitoring, but not the reverse. This finding is consistent with our current emphasis on the critical role of peers in adolescent development. It may actually be that coalitions with deviant peers attenuate family ties, as well

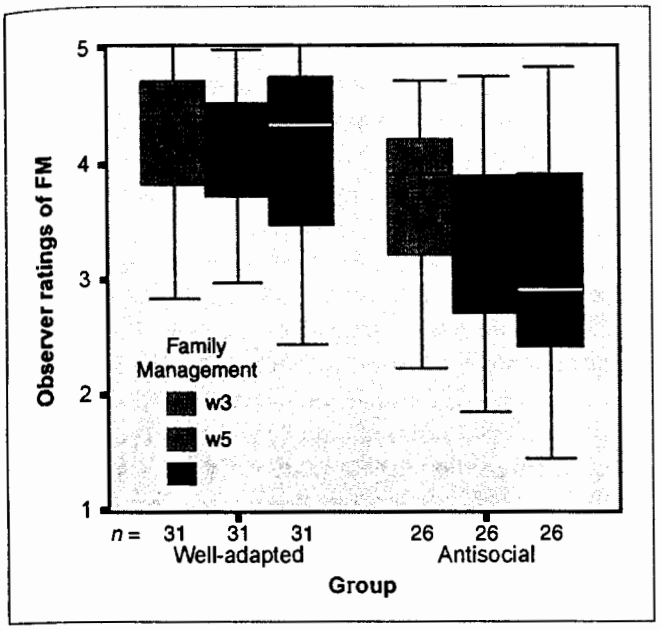

Figure 13.9 Observed family management in adolescence for low- and high-risk youth.

as provide a proximal context for escalations in problem behavior. Indeed, when we entered the family management slope score with the deviant friendship process intercept score in a hierarchical regression, we found an interaction between the two constructs in predicting adult antisocial behavior. Boys whose parents disengaged and who selected deviant friends were those who were highly antisocial at age 26.

These findings provide the basis for considering hypotheses regarding the social origins of the early- and late-starter developmental trajectories. It may be that children who start early are essentially adapting to coercive, chaotic parenting practices. In this sense, negative reinforcement may be an operational mechanism. For those who start late, positive reinforcement by peers may be the operating mechanism whereby problem behavior becomes a means to establish connectedness to a peer group.

It seems that early- and late-onset delinquents may come from two different worlds. Even the contingencies (positive reinforcement versus negative reinforcement) that maintain the antisocial behavior are different. In a discriminant function analysis, the variables that differentiated early-onset arrest from late-onset were poor discipline, unemployed parents, frequent transitions, and antisocial parent behavior (Patterson & Yoerger, 2002). In young adulthood, those same variables differentiated among those who would remain or drop out of adult crime. As we discovered recently, the linkage between parents' antisocial behavior and the social processes leading to the youth's antisocial behavior may be what distinguishes the early- from late-onset trajectory. In our analysis, we found that the father's antisocial tendency was the best predictor of the youth's future involvement in deviancy training 5 years later (Dishion, Bullock, & Owen, in press). This further supports the need to consider functional dynamics at different time scales. Some youth may be primed to find and interact with a deviant peer group early on, which results in the early display of the more serious conduct problem systems and the amplification of coercive dynamics at home, until, of course, the parent gives up. Thus, the nature of the world the child lives in makes a difference at both the micro and the macro levels.

Summary

Evidence was reviewed that provides support for the hypothesis that socialization exchanges within relationships are both a cause and an outcome of antisocial behavior. Over the past 25 years, considerable progress has been made in understanding the impact of parenting practices, both in longitudinal research and in the context of longitudinal field experiments. Parenting clearly makes a difference. However, it is unrealistic to consider either parenting or peer influences in isolation. A mesosystem model that incorporates both parenting practices and peer influences helps to explain the persistence and continuance of antisocial behavior into adulthood. We need more studies that demonstrate how it is that these two systems influence each other. Peer management and structuring practices may be one of the central roles of parents in effecting long-term adjustment in their children.

Behavior Settings

In much of the research on antisocial behavior, the impact of relationships is assessed as if it occurs in a vacuum. The ecological model alerts us to the importance of the context in which these relationships are embedded. Following Glen Elder's (Elder & Caspi, 1988; Elder, van Nguyen, & Caspi, 1985) persuasive lead, we conceptualize the impact of contextual variables, such as divorce, poverty, and neighborhood, on child outcomes to be mediated by the impact on parenting practices. Elder and his colleagues demonstrated that prolonged exposure to such major stressors as the economic depression of the 1930s did, indeed, lead to negative child outcomes. The effect was mediated by the presence of an irritable father and disrupted paternal discipline practices.

Extensive use was made of Elder's mediated model when studying the impact of various contexts on child outcomes in the OYS. The findings consistently support the model. For example, divorce is associated with negative child outcomes only for those mothers whose parenting practices are disrupted (Forgatch & DeGarmo, 2002). The findings are reviewed in Patterson, Reid, et al. (1992) and Capaldi, DeGarmo, Patterson, and Forgatch (2002).

The problem of studying contextual factors that contribute to individual-level psychopathology is not new. As in the study of peer influence, the issue becomes one of contrasting selection with influence. Families often select settings, and therefore, setting factors may simply reflect vulnerability associated with maladaptation. Parenting occurs in homes, which are in neighborhoods. Peer interactions take place in neighborhoods, in schools, at the bus stop, on the street, in shopping malls, in organized activities, and in families.

There are two new developments in research neighborhood effects. In this research, it is clear that neighborhood context contributes to the early onset of antisocial behavior (Ingoldsby & Shaw, 2002). The relationship tends to be mediated by parenting practices as much as the correlation between stress, poverty, and the development of antisocial behavior (Conger, Patterson, & Ge, 1995; Conger et al., 2002; McLoyd, 1990; McLoyd & Steinberg, 1998; Patterson, 1985; Sampson & Laub, 1994).

We know that deviancy in school is related to deviancy in the home. It is also clear that children who are deviant in both settings have a poorer prognosis. In several early studies, we found that maladaptation at home and school was a particularly poor sign for children and adolescents. For example, Dishion and Loeber (1985) found that boys who were physically aggressive at home and school showed high levels of risk on mother-son coercion, deviant peer association, and maternal rejection. More recently, young adolescents identified as *externalizing* and *internalizing* at home and school were found to be at extreme risk for substance abuse, arrests, and high-risk sexual behavior 2 to 3 years later in middle adolescence (Dishion, 2000).

By and large, the correlation in antisocial behavior across the two settings is not high. There are only a few studies that have collected careful observation data in both the home and the school setting. In an analysis of consistency in coercive interaction patterns, as observed in the playground and the laboratory setting with parents, we found a coefficient of .19 (Dishion, Duncan, Eddy, Fagot, & Fetrow, 1994), statistically reliable but unimpressive. In the Wichita study, Snyder et al. (2003) observed parent-child interactions in a standardized series of laboratory settings and sampled playground interactions with peers. Teacher ratings of aggression defined the classroom setting. A parent-child interaction composite correlated .25 with playground interactions with peers and .46 with teacher ratings of classroom behavior. The findings are in agreement with the conventional wisdom that trait behaviors generalize modestly across settings.

As discussed later in the chapter, some individuals are more sensitive to disrupted environments and therefore may show more cross-setting consistency. For example, in a study of home observation and school behavior problems, Stoolmiller (2001) found an interaction between the child's temperament (i.e., low inhibitory control) and parenting interactions in predicting long-term patterns of antisocial behavior at school. Using retrospective parent reports of child's poor self-regulation and direct observations of parent discipline, he found that inclusion of the interaction term between the two constructs accounted for growth in teacher-reported behavior problems at school from ages 9 to 14. This is a critical analysis for two reasons. First, the settings are relatively independent (home and school), and second, the model accounted for 38% of the variation in nonoverlapping constructs. The findings are quite consistent with those reported by two other investigative teams (Bates, Pettit, & Dodge, 1995; Shaw et al., 2003).

The contribution of schools to the etiology and course of antisocial behavior is likely to be much more complex than can be captured in a cross-setting consistency coefficient. To understand the contribution of schools to antisocial behavior, it is critical to examine academic failure, peer rejection, and the formation of peer groups (Patterson, Reid, et al., 1992). Our initial studies showed that most children who showed high rates of antisocial problems in the home tended to be academically below standard (Patterson, 1982). The analyses of data from the OYS showed a path coefficient of −.57 between a latent construct for antisocial behavior and the construct for school achievement (Patterson, Reid, et al., 1992). The Forgatch and DeGarmo (2002) review of findings from the Oregon Divorce Studies replicate this correlation between poor academic achievement and children's antisocial behavior.

As discussed earlier, there is more support than not for the idea that failure in academics and peer rejection contribute to the coalescence of deviant peer cliques over and above what would be predicted by the attraction of children who share antisocial behavior. We have referred to this process as the *confluence hypothesis* (Dishion, Patterson, & Griesler, 1994). However, the contribution of schools to the development and course of antisocial behavior may be most pronounced in early adolescents, with the advent of the mid-

dle school environment. We were able to predict the early formation of gangs in a multiethnic public school by academic failure and peer rejection (Dishion, Nelson, et al., in press). More recently, we examined the confluence hypothesis in eight middle schools in a suburban setting, with mostly European American early adolescents. Building off the work of recent studies (e.g., Laird, Jordan, Dodge, Pettit, & Bates, 2001; Rodkin, Farmer, Pearl, & Van Acker, 2000), we used both liking and rejection nominations to predict the formation of deviant peer cliques. We found that a multiplicative term of liking and rejection defined the likelihood that a young adolescent was to be submerged in a deviant peer clique in the next 2 years of middle school. As expected, growth in involvement in deviant peer cliques was associated with growth in problem behavior, using constructs that were defined by independent methods (Dishion, Light, & Yasui, 2004 paper presentation at ISSBD). Finally, there was significant variability by schools in peer rejection, deviant clique formation, and problem behavior; the three experiences were clearly concordant.

These are promising beginnings. But it is obvious that some pieces of the puzzle are missing. If schools contribute to the development and course of antisocial behavior, then it would be expected that effective school-based interventions and prevention strategies would have a profound impact. If such were the case, this would have a profound impact on public policy. The work by Kellam and colleagues (Ialongo, Poduska, Werthhamer, & Kellam, 2001) does suggest that interventions targeting the school environment do have long-term effects on the development and course of problem behavior. Recent progress in the development of school interventions that promote a more organized approach to managing student behavior is particularly compelling in this regard (Crone & Horner, 2003; Sugai, Horner, & Sprague, 1999). However, these schoolwide intervention strategies have yet to be tested in a randomized trial that includes data collected in both home and school. If school aggression is eliminated, as was the case for the LIFT study (Stoolmiller, Eddy, & Reid, 2000), what are the effects on aggression observed in the home? If levels of aggression occurring in the home are dramatically reduced, what is the impact on the school behaviors? At what point in development can such effects be expected? These are the three big next-generation questions that must be answered if we are to continue in our efforts to build a theory.

Self-Regulation

As we discussed, there is a paradox inherent in the research linking self-regulation with antisocial development. On the one hand, as hypothesized by Moffitt (1993), early-starting youth are less organized, regulated, and mutual in their social interactions with friends (Dishion, Nelson, Winter, et al., 2004; Dishion, Nelson, et al., in press). However, it is the youth who are both *antisocial* and *self-regulated* that are the most prone to continuing their deviance into adulthood. An untested assumption is that youth who become more polished and refined in manipulation are also more successful in avoiding detection for increasingly more serious crimes (burglary, robbery, drug sales). This would be a major wrinkle in the early-starting persistent hypothesis, but is quite consistent with an ecological view of adaptation (e.g., Bronfenbrenner, 1989; Hinde, 1989). Soldiers who survive the vicissitudes of war become better at killing; youth who survive the antisocial lifestyle get better at being deviant. The dynamic of self-regulated deviance certainly needs further exploration, but the idea that youth become more calloused and manipulative fits some of the literature relevant to adult psychopaths (Hare, Forth, & Strachan, 1992; Newman, Widom, & Nathan, 1985; Raine, 1993, 2002).

The majority of the literature on self-regulation, however, emphasizes individuals' ability to inhibit or avoid committing antisocial acts. To this extent, the construct itself may be vulnerable to the empirical quagmire described earlier, with global ratings of competence highly (negatively) correlated with global ratings of antisocial behavior.

There are several lines of research suggesting that measures of self-regulation are *not* redundant to the antisocial construct. Several investigators have empirically linked the concepts of resiliency, self-regulation, and problem behavior (Lengua & Sandler, 1996; Masten, Best, & Garmezy, 1990; Masten & Coatsworth, 1998; Miller & Brown, 1991; Wills & Dishion, 2004; Windle, 1990). A critical feature of resiliency at the individual level appears to be the capacity to engage in planful, goal-directed action, which includes selection of friends and partners conducive to one's goals (Haggerty, Sherrod, Garmezy, & Rutter, 1994; Rutter, 1989).

The notion of self-regulation is conceptually linked to the construct of temperament. Two decades of programmatic research on child temperament consistently reveal attentive control and inhibitory control as central to adjustment in socialization (Kohnstamm, Bates, & Rothbart, 1989). The capacity for self-control of behavior, cognition, and emotion falls under the rubric of executive attention (Rothbart, Ellis, & Posner, 2004). Recent neural imaging studies (e.g., Sowell & Jernigan, 1998) provide evidence of substantial adolescent and postadolescent brain development in frontal areas thought to serve executive

functions such as attentive control. These executive functions are largely located in the prefrontal cortex and, more specifically, the anterior cingulate cortex (ACC; Frith & Frith, 2001).

Linking neural imaging studies to pragmatic measures that assess individual differences and attentive control has been a recent goal. Posner and colleagues (Fan, McCandliss, Sommer, Raz, & Posner, 2002) developed a task under conditions of neural imaging that linked alerting, orienting, and executive attention to activity in the ACC as revealed in functional magnetic resonance imaging. The basic strategy in the attention network task (i.e., ANT) is to use perceptual conflict (i.e., Stroop) to engage various aspects of attention. The variation in reaction time is considered to be a useful index of attentive regulation, such as the ability to alert, orient to new stimuli, and deal with distractive stimuli.

From a developmental perspective, it makes sense that the form of self-regulation would vary from early childhood through young adulthood. For example, in the work by Kochanska (1993, 2002; Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996), inhibitory control is a key component of self-regulation in early childhood. However, as children adapt to new contexts such as the public school setting, other facets of self-regulation are likely to become critical. For example, as the demands increase for children to complete tasks with multiple steps, such as chores and homework, it is critical that behavior activation becomes a key component of self-regulation. In adolescence, with the introduction of free time and autonomy, it becomes critical for young people to resist temptation and stay the course on long-term objectives related to academic achievement and/or skill development. Finally, in young adulthood, a key component of self-regulation is the selection and identification of social and economic contexts that fit well with one's social, motor, and intellectual abilities.

The work on self-regulation and problem behavior is limited to understanding the development and course of adolescent drug use. In this work, the construct of self-control has been invoked as an individual characteristic that reduces the likelihood of developing a drug and alcohol problem once exposed (Miller & Brown, 1991; Wills & Dishion, 2004). In understanding substance use, self-regulation is seen as a moderator variable, explaining those youth who do not develop serious drug and alcohol problems given exposure by peers and spouses.

As discussed earlier, a process model for the development of antisocial behavior should describe the mechanism accounting for the normative decreases in overt antisocial behavior, the age-crime curve, desistence from antisocial behavior in late adolescence, and the fact that many youth exposed to deviant peer influences (i.e., growing up in the same neighborhoods and schools) are unaffected. In fact, if one looks at the data in even the highest risk settings, it is clear that 40% to 50% do not develop any signs of problem behavior; they are the zeros in our skewed distributions of problem behavior. Statistical innovations that allow for the formation of developmental trajectories (e.g., Muthén & Shedden, 1999; Nagin & Tremblay, 1999) always yield a large low-risk group (e.g., Connell et al., in press).

If self-regulation is a construct of empirical utility for explaining the development of antisocial behavior, then it should account for unique (nonredundant) variance, or at least function as a moderator variable. That is, self-regulation may explain why some children do *not* become antisocial given exposure to the right environmental conditions.

The literature establishing interaction effects on any dimension of child self-regulation and problematic environments is underdeveloped at this stage. If one focuses on the genetic underpinnings of self-regulation, there is some evidence supporting complex interaction between pervasive environmental experience and biological predisposition (see Caspi et al., 2002; Cloninger & Gottesman, 1987; Deater-Deckard, in press; Leve et al., 1998; Maccoby, 2000; Neiderhiser, Reiss, & Hetherington, 1996; Rhee & Waldman, 2002; Taylor, Iacono, & McGue, 2000). Perhaps most noteworthy in these studies is work reported by Caspi et al. showing an interaction among genetic vulnerability, abusive parenting environments in childhood, and propensity to violence in adulthood. However, the amount of variation accounted for by the interaction term is limited. This elaborate and innovative study requires further replication and extension.

Moderation Hypothesis

In our recent research on understanding and preventing adolescent problem behavior, we assessed self-regulation among adolescents at ages 15 to 17 years. We used two strategies for the assessment of self-regulation. The first was the Rothbart (Rothbart et al., 2004) measure of temperament extended into adolescence. This measure includes two scales assessing effortful attention control, otherwise referred to as attention control. The items on these scales are not simply the reverse of antisocial behavior, including behaviors specific to the ability to attend, persist in tasks, and regulate oneself in the context of competing demands. In addition, we assessed the youth's ability to alert, orient, and exercise executive control in the context of a computerized attention task referred to as the ANT. To consider the role of self-regulation in the development of problem be-

havior, we formulated three developmental groups based on longitudinal data from six yearly assessments. Both male and female adolescents following early- ($n = 39$) and late-starting ($n = 38$) and successful ($n = 37$) pathways were selected for the study.

The assessment of temperament included youth and parent report. The effortful attention control factor comprises the following subfactors: activation control, attention, and inhibitory control. The ANT assessment involves a flanker conflict paradigm that includes a central target arrow flanked on either side by arrows pointing in either the same (congruent) or the opposite (incongruent) direction of the target arrow. Incongruent trials generally produce longer reaction times than congruent trials, because the presence of incongruent flanker arrows causes a degree of attention conflict. The task allows calculation of individual difference scores in attention control. The score is computed via subtraction of congruent flanker trial reaction times from incongruent flanker reaction trials.

Unexpectedly, we found no covariation between the youth's performance on the ANT conflict task with either child or parent report of self-regulation. However, self-regulation was correlated moderately between parent and child report ($r = .34$). Therefore, we included only parent and child report of attention control as a measure of the youth's ability to self-regulate.

Figure 13.10 provides an overview of the findings. As can be seen, there is an orderly progression from less to more self-regulation when considering early starters, late starters, and successful students, respectively. Also of interest is the normality of the distribution across the two samples. The child report shows less variation than the parent report; however, both show increasing self-regulation associated with the developmental onset of antisocial behavior and the probable prognosis (Moffitt, 1993; Patterson & Yoerger, 1993).

If self-regulation is a resiliency factor, then youth who are highly self-regulated are likely to be less influenced by deviant peers. A general construct for the youth's antisocial behavior was formulated on self-reported delinquency and antisocial behavior and substance use. As revealed in a hierarchical linear regression, both self-regulation and deviant peer involvement significantly predicted antisocial behavior in middle adolescence. It is relevant that self-regulation added to the prediction accounting for 43% of the variation in antisocial behavior (total R2 = .43 with both predictors). In a second step, the interaction between self-regulation and deviant peer involvement was entered into the equation. A significant interaction was found between self-regulation and deviant

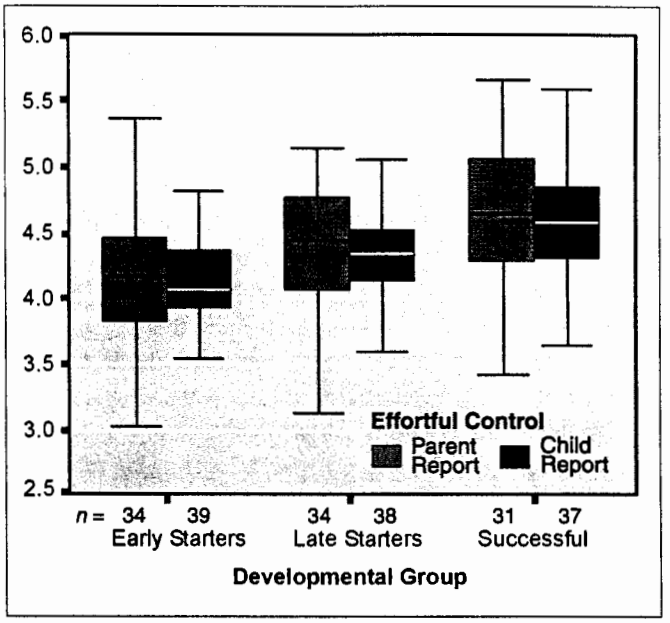

Figure 13.10 Toward a single model for the development of antisocial behavior.

peer involvement. Plotting of the interaction term revealed a tendency for youth who were high in self-regulation to be less affected by the influence of deviant peers on antisocial behavior. In contrast, for youth low in self-regulation, the level of antisocial behavior varied quite dramatically as a function of their deviant peer involvement (T. Gardner & Dishion, 2005).

These data show some support for the construct of self-regulation as a resiliency factor in the development of antisocial behavior. Significant methodological problems require attention, however, before the research can be considered conclusive. First, the lack of correlation between the attention measure of self-regulation and both parent and adolescent reports of attention control requires some explanation. One likely explanation is that early in development, children's ability to control attention in a laboratory setting may, in fact, predict parent ratings of self-regulation. By adolescence, self-regulation may become more domain-specific. For example, the ability to regulate oneself in detailed, tedious tasks may be highly influenced by the content and practice with similar tasks (e.g., videogames, writing, math). Second, we used the ANT measure of attention control in the home and the research center, using a variety of computers. The context of the task may require more control to accurately assess individual differences in attention control. Third, a more rigorous test of the resiliency hypothesis is to show longitudinal, interaction effects. That is, youth with higher levels of self-regulation who were also exposed to pathogenic

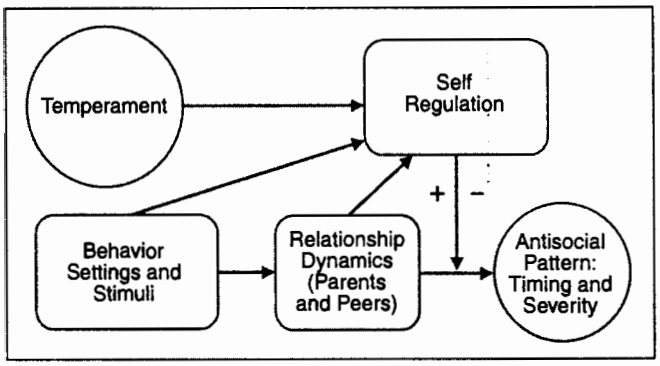

Figure 13.11 Self regulation by timing of the development of antisocial behavior in Project Alliance sample.

peer and parenting environments do not escalate in antisocial behavior.

Despite these barriers, we propose a hypothesis linking self-regulation to antisocial behavior, which is summarized in Figure 13.11. We hypothesize that self-regulation *moderates* the relationship between relationship dynamics, such as coercive family interaction or peer deviancy training, and the timing and severity of child and adolescent antisocial behavior. Because the parenting environment of the early-starting group is disrupted, these youngsters are less able to navigate their own future. Late starters, however, benefit from early family management and therefore have higher levels of self-regulation. Consistent with recent work in neuroscience, we see self-regulation as linked to growth of attention networks that empower behavior inhibition and that early childhood is an important time for the development of this ability (Rothbart & Posner, Chapter 11, this *Handbook*, Volume 2).

Particularly important for further investigation are the family management underpinnings of self-regulation in children. One can see that setting limits and behavior management of children require the child's exercise of behavior inhibition and therefore growth in self-regulation. This hypothesis requires more attention, in particular, in the context of intervention trials that address family management. Do improvements in family management in early childhood, a time critical for the development of self-regulation, have long-term effects on adolescent problem behavior? The work by Olds and colleagues (1997) suggests it does. More to the point, do interventions that specifically target self-regulation in children have independent effects on the prevention of antisocial behavior, as suggested by the work of Lochman and Kazdin (e.g., Kazdin et al., 1992; Lochman & Wells, 1996)?

If these research hurdles are surpassed, the mechanisms linking socialization processes and the acquisition of rule-governed behavior need explication. In the learning theory literature, Hayes and colleagues (Hayes, Gifford, & Ruckstuhl, 1996; Hayes & Hayes, 1992; Hayes, Hayes, Sato, & Ono, 1994) provide the most comprehensive account of the role of language in human learning. The ability to follow rules is built on the acquisition of a linguistic frame that presumes "it's worth it to be prosocial." The framework is theoretically rich but has yet to be linked to observations of family living and individual differences in child and adolescent self-regulation and engagement in antisocial behavior.

SUMMARY AND IMPLICATIONS

Over the past 10 years, enormous progress has been made in understanding the development of antisocial behavior. Figure 13.12 is a summary of empirical linkages that have been established, as well as those that, at this writing, are tentative and require further testing. Four points are emphasized in this summary:

1. Although antisocial behavior is a robust, psychometrically sound construct, it is useful to understand developmental process and gender differences to consider specific forms of antisocial behavior, including distinctions between overt (physical and verbal aggression, reactive aggression) and covert (proactive aggression, relational aggression, stealing, etc.).
2. Parent-child interaction and management dynamics play a significant role in establishing the child's trajectory into antisocial behavior in early and middle childhood as well as adolescence, and intervention research reveals that targeting parenting practices produces reductions in child and adolescent risk.

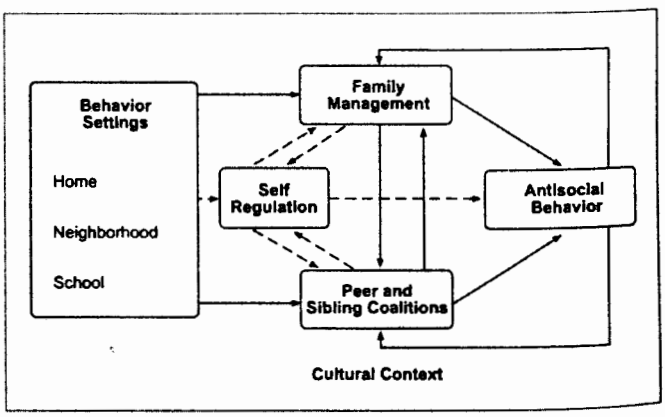

Figure 13.12 Empirical summary for the development and ecology of antisocial behavior.

3. Peer influences are now a dominant theme in the etiology of antisocial behavior, beginning in early childhood and increasing during adolescence. Intervention research, inadvertently, underscores the power of peer contagion in amplifying adolescent problem behavior.
4. Neuroscience and developmental research are converging at understanding the basic brain-behavior linkages that explain the emergence and growth of executive control and, ultimately, self-regulation. Future research in this area might lead to a theory of normative socialization, resilience, and differential prognosis associated with age of onset of antisocial behavior and, perhaps, other forms of psychopathology.

In Figure 13.12, the solid arrows represent hypotheses that are supported by previous longitudinal and intervention research, and the dotted lines are hypotheses that require further testing and development. In contrast to 10 years ago, the field has extended research to children of different cultural and racial groups. At some point, isolating the mechanisms that explain contextual differences in child and adolescent problem behavior remains a scientific need. Similarly, process-oriented research that considers the interplay between biology and family and peer dynamics, especially around developmental transitions such as adolescence, is still needed.

At this stage, we assert that enough is known to fill in a rough sketch of the antisocial developmental process, especially for understanding boys who exhibit a persistent life course pattern. The development of more serious and chronic antisocial behavior seems to follow a stage-like progression, consistent with notions of hierarchical integration. In the coercion model, the practice of aversive pain control in the family undermines relationships and entrains response patterns that facilitate the emergence of antisocial behavior in other settings, such as schools (with teachers and peers). Eventually, the antisocial behavior is less reactive, and children develop peer groups that encourage problem behavior and even plan and collude to commit antisocial acts. As shown in the classic analyses by Jones, Reid, and Patterson (1975), deviant children are, indeed, less responsive to setting differences. They react coercively over time and across settings.

This style of interacting with peers becomes automatic and highly stable across adolescence, providing a basis for ongoing shopping for relationships and settings that support previously established behaviors and patterns. If unabated, parents eventually give up and peers take over, accounting for the persistence of adolescent problem behaviors into adulthood. Those who start early, then, actively construct social experiences that minimize their pain and maximize their gain. In the short run, such social optimization functions well. Unfortunately, in the long run, the antisocial pattern undermines the maturation into adult roles and the formation of new families. Selection of an antisocial spouse could permanently cement the developing adult in a life of maladaptation through criminal behavior, incarceration, and ever more coercive family relationships (Quinton, Pickles, Maughan, & Rutter, 1993; Woodward, Fergusson, & Horwood, 2002).

One of the barriers the present authors continually confront is how to integrate positive aspects of development with our understanding of the biological and environmental influences in antisocial development. We project that the next 10 years will be marked by progress on this issue. In particular, we consider a convergence of findings on understanding young children's development of emotional regulation, attentional control, tendency to comply with adult requests, and prosocial behavior. Eisenberg and Fabes (1998) provide a comprehensive review of this rapidly growing literature.

The promise of the developmental psychopathology perspective is to continue to focus on the intervention implications of etiologic research (Cicchetti & Toth, 1992). An explicit strategy for the programmatic integration of etiologic research and intervention trials has been proposed (Patterson, Reid, et al., 1992). We can suggest alternative intervention strategies to reduce or prevent antisocial behavior (Dishion & Stormshak, in press). The key idea, however, is not only to get intervention effects (i.e., reductions in antisocial behavior), but to document how the intervention effects are achieved—that is, to understand the process of change (Dodge, 1993). Such an approach makes developmental psychopathology a dynamic science and, as applied to the understanding and prevention of child and adolescent antisocial behavior, worthy of further pursuit.

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