

Family and Peer Influences on Adolescent Behavior and Risk-Taking

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I. Introduction and Goal

The high-risk behaviors of adolescence are the result of multiple causes, often beginning in early childhood, that change with age and are interrelated in complex ways. These causes operate at ecological (e.g., socioeconomic status, neighborhood, cultural context, social-relational (e.g., family members, peers, teachers), and individual (e.g., genetic dispositional factors and temperamental characteristics, sex) levels, that unfold against the backdrop of biological, neuro-cognitive, and emotional maturation and shifts in age-related social-developmental processes. Research in the past two decades has highlighted the central role of genetics as a major factor contributing to the most troubling and costly outcomes of adolescent risk-taking, including violence, criminal activity and substance use disorders (Jaffee et al., 2005; Taylor, Iacono, & McGue, 2000). However, there is mounting evidence that genetic influences on a variety of problem outcomes reflect a complex interplay between inherited and environmental risk, with genetic risk leading to pathological behavior for some youth only when the primary socializing environment also is adverse (Cadoret, Winokur, Langbehn, & Roughton, 1996; Reiss & Leve, 2007; Tienari et al., 2004). Families and peers, the most significant socializing contexts for the emergence of risky behaviors, are the foci of this paper.

Considerable evidence suggests that family and peer contexts provide the proximal nexus at which genetic and many other social-contextual factors converge to produce risk-taking behavior in adolescence. The bulk of adolescent risky behavior— such as drinking, reckless driving, or delinquency - occurs in peer groups. However, the family provides the developmental foundation (or deficiencies) in social and emotional skills and values that, in turn, influence adolescents' selection or association with peers that ultimately determine whether they initiate, escalate and persist with these behaviors. This paper summarizes findings on family and peer influences that have been linked to adolescent risk-taking behavior, including adolescents' participation in antisocial activities, their use of alcohol and other illicit substances, and their involvement in associated behaviors, such as risky sexual activity and risky driving.

The goal of this paper is to summarize what is known about (1) the key features of families and peers that influences adolescent risk-taking behavior, (2) the underlying processes or mechanisms by which these influences shape risky behavior, (3) how family and peer influences moderate and partially mediate genetic influences, and the broader social settings and cultural contexts of development, (4) and the interplay between family and peer influences on adolescent risk-taking.

Common Risks and Divergent Paths to Risky Adolescent Behavior

Although many risk-taking behaviors have been studied separately, as independent outcomes (e.g., alcohol use and abuse, antisocial behavior, sexual risk-taking), they share substantial common variance. Several longitudinal studies provide remarkable convergence with the genetic literature in demonstrating that externalizing symptoms (aggressive, impulsive, and undercontrolled) appearing in early childhood are predictive of substance use outcomes 15 to 20 years after the first appearance of these symptoms (Masse & Tremblay, 1997; Mayzer, Puttler, Wong, Fitzgerald, & Zucker, 2002; 2003;). These findings are further supported by research showing similar markers assessed in middle childhood predict drunk driving outcomes in adolescence (Cloninger, Sigvardsson, Przybeck, & Svrakic, 1995). Numerous studies also show smoking and alcohol use predict later use of illicit drugs, with those youth that initiate drinking at earlier ages being most likely to transition to use and abuse of illicit drugs in mid to late adolescence (Hawkins, Catalano, & Miller, 1992). Risky driving and early, unprotected sexual activity, and teenage parenthood also occur at higher rates among those who show problem behavior, associate with antisocial peers, or when alcohol or drugs are involved (Mayes & Suchman, 2006; Shope, Waller, Raghunathan, & Patil, 2001). An explanation for such high levels of co-occurrence is that these behaviors share common origins or serve common functions. Several scholars suggest, for example, that there is a high-risk profile of temperamental difficulties, low inhibition, and cognitive deficits for conduct problems that also reflect a high risk profile for engaging in other risk-taking behaviors, such as use and abuse of substances in adolescence (McGue, 1994; Zucker, Donovan, Masten, Mattson, &

Moss, 2009). While there is strong support for this assertion, and for the central role of parents and peers in shaping trajectories by which these common vulnerabilities produce multiple outcomes (*multifinality*), there is substantial heterogeneity in patterns of risky behavior that also suggests divergent pathways (*equifinality*) leading to the same problem outcomes (Cloninger, Bohman, & Sivgardsson, 1981; Lahey & Waldman, 2003; Moffit, 1993).

Several seminal papers (Farrington, 1991; Loeber, 1988; Moffitt, 1993; Patterson, Reid, & Dishion, 1992) highlight multiple pathways for conduct problems. Moffitt (1993) distinguished between two subtypes and labeled them life-course persistent (LCP) and adolescence-limited (AL) conduct problems, a distinction that has been supported in several longitudinal studies (Caspi & Moffitt, 1995; Lahey et al., 1998; Loeber, Green, Keenan, & Lahey, 1995; Moffitt, Caspi, Rutter, & Silva, 2001; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). LCP offenders' antisocial behavior has its origins in neurodevelopmental processes, begins in childhood and continues to worsen thereafter, and is associated with a very high level of both individual (such as lower cognitive skills, hyperactivity, and adverse temperamental features) and family risk factors (such as parental antisocial behavior, teenage and single parents, maternal mental health problems, and low SES). In contrast, AL has its primary origin in social processes, particularly through an affiliation with and mimicking of antisocial peers, begins in adolescence, and desists in young adulthood. Although this group also is influenced by family and peer factors, the specific types of influences and their timing seem to differ.

Research on trajectories of alcohol use also provides clear evidence that alcohol use disorder (AUD) is a heterogeneous family of disorders (Chassin, Pitts, & Prost, 2002; Cloninger, et al., 1981). Age of onset is critical to the classification of the phenotype, as is the co-occurrence of externalizing or internalizing symptomatology. Children who begin drinking at an early age (11 or 12 years) are much more likely to develop a substance abuse disorder in their teens or early adulthood compared even with those who delay until later in high school (DeWitt, Adlaf, Offord & Ogborne, 2000). These youth are also

more likely to display other problematic behaviors and complications, including use of hard core drugs, risky sexual behavior, and criminal activity (Fergusson & Horwood, 1997). Although multiple profiles have been described, Zucker et al. (2008) offered a crude distinction between an “early-onset, high-risk, high-chronicity trajectory stemming from a complex interplay involving individual risk (high undercontrol) and high family and socioenvironmental risk, and a number of shorter course trajectories that are driven by environmental (e.g., drug availability), peer, and stage-dependent (late youth and young adulthood) influences or specific environmental stressors (divorce, death, trauma). A third group displays a gradual onset that occurs in high-stress environments among those with genetic drug vulnerability and continues without psychiatric comorbidity. The early onset group likely shares etiological pathways with the early starter category for antisocial behavior, a conclusion supported by several longitudinal studies as well as recent family and twin studies indicating that the heritability of AUD is primarily through a common externalizing factor (Kendler, Prescott, Myers, & Neale, 2003; Nürnberger, Brunner, Kermmerling, & Piater, 2004). These same studies also support a secondary pathway through an internalizing common genetic factor. Thus, although many of the family and peer factors described below will be presented as common risks that apply across outcomes, the strength and pattern of effects are likely to vary depending on the age of onset, and the specific phenotype of the risky behavior.

II. Substantive and Methodological Issues

Confounds between Family Influences and Genetic Effects

Positive correlations between parenting behaviors and child outcomes are ubiquitous: parents who hit their children have children who are at risk to become aggressive, parents who abuse alcohol have children who are at risk to abuse alcohol, parents who achieve high educational status have children who are likely to achieve high educational outcomes, etc. Although these significant correlations still allow for “mis-matches” that must be understood, they point toward trans-generational

transmission of behaviors. However, they tell little about how family influence operates. The confound is that biological parents pass along both genes and social influence to their offspring, and thus an apparent family socialization influence may mask a true genetic effect.

Adoption studies that attempt to disentangle these processes have revealed that in some domains both genetic and socialization effects operate. Mednick (Hutchings & Mednick, 1973), Cloninger (Cloninger, Sigvardsson, Bohman, & van Knorring, 1982), and Cadoret (Cadoret & Cain, 1981), have each independently pioneered the use of adoption studies to disentangle the effects of heritable factors (based on biological parents' status) and environmental factors (based on adoptive parents' status) in predicting child outcomes. The design of these studies is simply a two (biological parents' antisocial behavior as no or yes) by two (adoptive parents' antisocial behavior as no or yes) factorial, with the child's behavior as the outcome. All of these investigators have identified parent socialization influences that cannot be dismissed as simple genetic effects.

Twin studies as pioneered by Kendler et al. (1995) offer a second approach to disentangling genetic and parenting influences, in which monozygotic and dizygotic twins within families are compared, to control for genetic variation. Jaffee et al. (2005) used this approach to test the interaction of heritable risk and parents' physical maltreatment of their child to predict psychiatric conduct disorder (CD) and found significant impact of parents' maltreatment that is not accountable by heritable risk.

Two issues in gene-environment interplay complicate the simple disentangling of genetic and parenting influences. First, many studies (including all of the studies referenced above) find a significant interaction effect between heredity and parenting. That is, the effect of socialization varies across families as a function of genes. Thus, taking into account genetic variables is necessary not only for de-confounding a methodological conundrum but also for understanding the context (in this case, the genetic context) in which family influences operate. The second issue is that although these research designs disentangle genes from parenting, in reality they are correlated and may influence each other.

So, although genetic factors may account for a significant portion of the variance in a child's behavior, that effect may operate through genetic effects on parenting, which in turn mediate the genetic effect on child outcomes. These effects may operate in several ways that reflect the transactional nature of behavioral development. For example, a parent's genes may influence that parent's behavior toward the child, which, in turn, socializes the child to behave in particular ways that appear to be the effect of a parent's genes on a child's behavior. Second, a child's behavior, especially temperament, may influence the parent to respond in particular ways that, in turn, exacerbate or minimize the effect of genetically-influenced temperament on the child's outcomes.

Self-Selection Versus Influence

Because children are active players in their socialization, rather than passive recipients of influence, another methodological problem must be solved, which is a selection bias known as homophily and assortative mating. Homophily is the tendency for individuals to interact with other individuals who share a characteristic, and assortative mating is the tendency for individuals to marry selectively. Lazarsfeld and Merton (1954) identified the tendency of deviant adolescents to seek out other deviant adolescents for the purposes of co-conspiring in deviant behavior. Correlational studies that fail to account for selection biases may inaccurately attribute causal peer influence to outcomes that in fact represent continuous individual effects. Thornberry (1998) has acknowledged this tendency but found that even accounting for selection, the deviant peer group exerts a facilitative effect on exacerbating, growing, or multiplying deviant behavior. This analysis allows for self-selection of peer influence, that is, the idea that adolescents who want to engage in particular behaviors may seek out a peer group that facilitates that behavior. The causal factors here are both selection and peer influence. Burton's (2007) ethnographic analysis suggests an even more complicated phenomenon in which adolescents might affiliate based on one characteristic that happens to be correlated with another characteristic that influences outcomes. So adolescents who are from disadvantaged or traumatic

backgrounds might "find" each other because of that common ground; coincidentally, they may each have deviant behavior tendencies that synergize to lead to even more deviant outcomes. Given the correlations between background characteristics and current behavior, this pattern is not coincidental at all. Furman and Simon (2008) have described similar interpersonal dynamics in adolescent romantic relationships that explain how assortative mating might influence outcomes for each partner.

Family-Peer Interplay

Interaction effects between genetics and parenting raise the broader point that empirical analyses of family and peer influences must account for interplay between family and peer factors. The term "interplay" as used by Rutter (2006) is preferred over interaction effects because, beyond the interaction effect, it also includes family-peer correlations, transactional effects, and reciprocal influences. All of these phenomena occur in adolescence and must be accounted for in understanding family and peer influences. Families that monitor and supervise their adolescent closely are relatively less likely to have offspring who associate with deviant peers (Laird, Pettit, Bates, & Dodge, 2003). Parents who display inconsistent and harsh discipline have children who become ill-equipped to engage successfully with peers, who, in turn, reject these children. Dodge et al. (2009) have empirically described a dynamic cascade model of how parents and peers influence each other in influencing adolescent outcomes. Cross-sectional descriptive studies are usually inadequate to sort out these various effects; even prospective studies are challenged unless they include multiple family and peer variables across multiple time points.

The dynamic cascade model has been proposed by Masten (2006) and empirically supported in two separate samples by Dodge et al. (2008; 2009). This model describes reciprocal influences between parent and peer factors across development. Early in life, parental factors of low warmth and high harsh discipline lead some children to lag in developing social-cognitive skills and competence. When this child comes to school, her peers reject her and engage in aggressive conflicts. These conflicts,

in turn, make it difficult for a parent to engage in warm, supportive parenting, and so ironically these parents withdraw supervision and monitoring during early adolescence when it is needed most. The adolescent is thus free to affiliate with deviant peer groups, who propel the adolescent toward deviant behaviors, including violence (Dodge et al., 2008) and substance use (Dodge et al., 2009).

Moderation by Culture

An important substantive finding to be described later in this chapter that family influences vary significantly across cultures raises a methodological challenge that findings in this domain are limited by the cultural context in which they occur. Parenting behavior is given meaning within a cultural context, and so its impact on an adolescent will vary across cultures (Lansford et al., 2005). In order to understand the magnitude and nature of a parenting factor, its cultural context must also be understood, thereby increasing the demand to scholars to examine similar parenting behaviors across many cultural groups. A similar point applies to peer influences. Culture shapes how adolescents value peer group acceptance, popularity, friendships, and peer influences. In American peer culture, the value of deviant behavior in determining popularity increases as children move into early adolescence (Cillessen & Mayeux, 2004). It is not yet known how cultures across the world differentially value various peer processes.

Nonlinear Effects

It has become increasingly obvious that family and peer influences are not best modeled as linear effects (Deater-Deckard & Dodge, 1997); often, parenting effects are rather nil until a threshold is reached, at which the impact is dramatic. The case of physical discipline and maltreatment stands out here, where it has been found that effects of differences between mild and moderate harsh discipline are not as strong as differences between moderate discipline and maltreatment (Deater-Deckard & Dodge, 1997). The recognition of these effects has increased the methodological demand for better

statistical modeling of nonlinear effects and samples that include a broader range of family and peer influence levels.

Influence by Perception

Finally, the repeated substantive finding that many family and peer influence effects operate indirectly through an impact on the adolescent's perceptions and the meaning given to the factor (Gibbons, Pomery, & Gerard, 2008) raises another methodological challenge that measures of family and peer influence variables are biased by the perspective of the source. Self-reports about peer deviance may be biased just as are parent reports of an adolescent's behavior. Although these perspectives are important in their own right, they present a challenge to researchers to measure family and peer variables independently and objectively, which is very difficult for variables such as family and process.

III. Normal Developmental Process

Initial Parental Influence

The human species has evolved such that infants are born into this world with a set of genetically-endowed characteristics to respond to social influences from family and peers. Relatively few genes directly render infants capable of survival on their own; rather, genes program infants to be particularly ready to attend to, respond to, and learn from, social beings around them. Paradoxically, although humans ultimately become capable of highly independent living, they are born more dependent on others for survival than almost all other species. Genes and environments are not independent sources of influence; rather, they fit each other like hand-in-glove. Genes operate by making infants responsive to the social environment.

And so at birth, the human infant is highly attentive to her mother for survival, growth, and development of competence. Naïve claims that parents matter little are based on studies of individual variation in parenting in the middle range; they fail miserably by ignoring species-wide influences that

parents have over the infant's development of a social place in the world that is necessary for survival. These claims also ignore the devastating consequences of parental behaviors at the negative extreme, as in abuse and neglect, and they ignore the life-saving influence that parents play in promoting resilience in challenged infants and in nurturing outstanding accomplishments at the positive end. Parents influence infants through the nurturance of a secure attachment, promotion of working models of how the social world operates, provision of values and cultural norms, and affordance of environmental exposures.

Growth in Peer Influence in Early Adolescence

From birth through early adolescence, Parke's tripartite model describes well the parent's predominant influence through direct interpersonal relationship with the growing child, discipline responses to both desired behaviors and misbehaviors, and management of the child's environment. Peers influence the child's behaviors from early ages onward, and peers captivate a child's attention in ways that no adult can match, but the parent has major control over the child's access to peers, and which peers, through decisions about child care, schooling, after-school placement. But the task of childhood is to grow into adulthood ready for procreation, co-existence in a social milieu, and contribution to the social good, and so through evolution the species has developed mechanisms that promote expulsion from the sphere of parental influence and replacement by reliance on peer influence.

By early adolescence, the child's growing independence affords access to peers over which the parent has less control. Instigated by puberty and perhaps other biologically-based and evolutionarily-based motivation for affiliation with a peer group and with romantic partners, the early adolescent heightens attention and source of influence to the peer group. In adolescence, the peer group becomes extremely salient, as 85 percent of American adolescents report being a member of a peer crowd (Brown, 2004). Costanzo and Shaw's (1966)'s initial finding of dramatically increasing

conformity to peers' attitudes and behavior during early adolescence (depicted in Figure 1) has been well-replicated in several antisocial domains (Brown, Bakken, Ameringer, & Mahon, 2008). This pattern of peer conformity does not reflect a general tendency to be unable to resist peer pressure, but instead probably reflects the high value and salience of the peer group as a reference (Steinberg & Monahan, 2007). At the onset of the teen years, American children demonstrate increased conformity to peers for antisocial behavior, which does not abate until the end of the teen years.

This pattern of accelerating peer influence on antisocial behavior co-occurs with changes in brain structure and function during this period that include heightened reward processing coupled with a still immature self-regulatory system (Steinberg, 2009). The salience of peer groups coincides with these brain changes such that the two influences interact. The result is a behavioral pattern of rapidly increasing preference for risk that does not begin to decline until later adolescence (Steinberg, 2009, also depicted in Figure 1). As shown in Figure 1, the age-peer conformity curve is remarkably similar to the age-risk preference curve, with the former perhaps preceding the latter by two years. The risk preference pattern has been characterized as "starting an engine without yet having a skilled driver" (Steinberg, Dahl, Keating, Kupfer, Masten, & Pine, 2006, p. 721). Adding the heightened peer conformity dimension suggests that the unskilled adolescent driver who starts the engine may be driving with backseat peer drivers influencing decision-making. It is no wonder that this period is characterized by heightened antisocial behavior that occurs in peer groups.

Resolution: Balance between Family and Peer Influence in Young Adulthood

As adolescents move into adulthood, self-regulatory skills improve and peer conformity declines. General skill in making independent decisions and resisting peer influence increases steadily across the adolescent years (Steinberg & Monahan, 2007) so that the late adolescent becomes cognitively and socially more able to make independent decisions. However, it is not the case that peer and family factors no longer exert influence at all; rather, a task of this period of emerging adulthood

becomes balancing peer and family influences through self-regulation. Individuals resolve this task in unique ways that are not yet well understood (Arnett, 2000).

IV. Family Influences

Three broad categories of family influence have been studied in the literature on adolescent risk-taking: the quality of family interactions, parenting styles and practices, and family modeling and socialization of risky behaviors. These family factors are not exhaustive of the broad array of family influences that have been implicated in the prediction of adolescent risk-taking. Additional family characteristics, such as family psychopathology, parents' socioeconomic status, maternal age at the birth of the child, ethnicity, and family size and structure (intact versus non-intact) play contributing roles as well. Indeed, one of the most robust predictors of alcoholism risk is a positive family history, with the biological offspring of alcoholics being approximately three to five times more likely to develop alcoholism during their lifetime and more likely to begin using alcohol and drugs in adolescence than the biological offspring of non-alcoholics (Chassin, Rogosch, & Barrera, 1991; Hawkins, Catalano, & Miller, 1992). High rates of mental health disorders, such as depression, also are found in parents and siblings of substance abusers (Mayes & Suchman, 2006). Antisocial behavior tends to run in families as well, with concordance between siblings growing up in the same family (Rowe, Rodgers, & Meseck-Bushey, 1992) as well as between parents and children (Herndon & Iacono, 2005). However, evidence suggests the effects of parent psychopathology are largely transmitted through genetics and through the family relationship and socialization processes featured in the following sections (Chassin, Ritter, Trim, & King, 2003; Jacob et al., 2003; Laub & Sampson, 1988). Family socioeconomic and structural conditions also have indirect effects, operating principally through the family processes discussed below.

Quality of Family Interactions: Hostility, Conflict, and Coercion

There is overwhelming documentation from cross-sectional and longitudinal studies that high levels of hostility and conflict, recurrent episodes of anger and aggression, and coercive interactions

among family members increase risk for a wide variety of emotional and behavioral outcomes in children, including aggression, conduct disorder, delinquency, anxiety, and depression. Conditions ranging from living with irritable and quarreling parents (Davies & Cummings, 1998; O'Brien, Margolin, John, & Krueger, 1991) or siblings (East & Shi, 1997; Hall, Henggeler, Ferreira, & East, 1992), to being exposed to violence and abuse at home (Dodge, Petit, & Bates, 1994; Malinosky-Rummell & Hansen, 1993; Small & Luster, 1994) have been associated with adolescent risk-taking behaviors. Abundant evidence also indicates that hostile, coercive, and punitive parenting is associated with increased risk-taking in adolescence, particularly antisocial behavior and substance use problems (see Rothbaum & Weisz, 1994 for review).

Some of these findings reflect children's influences on their parents (child effects), rather than the risk associated with a hostile family environment. Twin and adoption studies show quite clearly that aggressive or temperamentally vulnerable children evoke harsh parental responses, even from biologically unrelated (adoptive) parents, and they make it more likely that parents will emotionally withdraw, supervise less well, and parent more harshly (Kandel & Wu, 1995, Cohen & Brook, 1995; Rutter, 2006). However, evidence also supports reciprocal effects, whereby parental negativity intensifies temperamental vulnerability or subclinical levels of disruptive behavior over time into more serious conduct problems (Ge et al., 1996; Narusyte, Andershed, Neiderhiser, & Lichtenstein, 2007). Bates et al. (1998) found these reciprocal effects linked infant characteristics (e.g., hyperreactivity, impulsivity, and difficult temperament) to externalizing problems 10 years later when children were young adolescents. Genetically informed studies also show a large effect of genes on the association between child antisocial behavior and being the victim of child abuse (passive gene-environment correlation), but an effect of abuse is also shown above and beyond genetic effects and even after controlling for parental history of antisociality (Jaffee et al., 2005). Interactions between genetic or temperamental vulnerability and a hostile family context also have been reported in a number of family,

twin and adoption studies (Cutrona et al., 1994; El-Sheikh & Buckhalt, 2003; El-Sheikh & Flanagan, 2001; Leve, Kim, & Pears, 2005; Legrand, McGue, & Iacono, 1999; Mednick, Gabrielle, and Hutchings, 1983; Stice & Gonzales, 1998). Thus, findings across methodologies converge to suggest that family transmission of risk-taking behavior, particularly antisocial behavior and alcohol use disorder, is both genetically and environmentally mediated, and some individuals are temperamentally or genetically more susceptible to the negative effects of a hostile or abusive family context.

Research on family conflict and harsh parenting has supported a number of mechanisms to account for their consistent link with risk-taking behavior. Patterson's (Patterson, 1982; Patterson, Reid, & Dishion, 1992) developmental model of antisocial behavior posits that behavioral undercontrol and high negative affectivity of a genetically vulnerable child provides a basis for oppositional behavior that incites negative affective responses and restrictions from parents which, in turn, produce increasingly aversive parent-child exchanges; Patterson (1982) coined the term "coercion cycle" to describe the escalation in negativity that occurs between parents and children. Similar coercive exchanges can occur with siblings and peers. Patterson's model charts a developmental trajectory in which these coercive family processes produce a worsening or growth in conduct problems over time, subsequently leading to rejection by normal peers, school failure, and involvement in deviant peer groups whose norms further promote antisocial behaviors and risk-taking in adolescence. This model is particularly relevant to early-onset trajectories, and it appears to generalize to the development of a diverse set of problem behaviors, including substance use, antisocial behavior, academic failure, and risky sexual behavior.

Even in the absence of a strong genetic predisposition, hostile and coercive family processes may provide a context that increases risk-taking in adolescence because it impedes children's acquisition of critical developmental competencies, or because it leads to internalizing symptoms (anxiety and/or depression), offering yet another path to use and abuse of substances. Repetti, Taylor and Seeman (2002) reviewed evidence showing children from risky families experience disruptions in their

physiologic/ neuroendocrine functioning, especially in response to stress, and also develop deficits in emotion processing, social competence, and behavioral self regulation. The arousal generated by hostile parent-child relationships, particularly in the context of high family conflict, causes children to become more reactive over time, with increased physiological reactivity, anger, anxiety and fear (Davies & Cummings, 1998; O'Brien, Margolin, John, & Krueger, 1991). If the conflict or hostility is recurrent and intense, the chronic stress that it creates may not allow a period of recovery that is essential for proper function of homeostatic physiological processes (McEwen & Stellar, 1993).

These children also have limited exposure and practice implementing complex social skills (e.g., open, effective communication, with mutual sharing and empathy), and their parents are less likely to engage in active efforts to shape their social competencies through discussions of social problems and advice giving (Laird, Pettit, Mize, Brown, & Lindsey, 1994). The link between physical abuse and harsh discipline at home and aggressive behavior with peers also is partially mediated by patterns of social information processing, such as the tendency to attribute hostile motives to others, to pay less attention to relevant social cues, and to think of fewer effective behavioral responses to problematic social situations (Dodge, Bates, & Pettit, 1990; Dodge, Bates, Pettit, & Valente, 1995). Whether because of distorted social information processing, increased sensitivity to rejection, or lack of adequate modeling, adolescents that have been exposed to abuse and other forms of family conflict have fewer of the social skills needed to facilitate successful interactions and supportive relationships (Carson & Parke, 1996; Cicchetti & Carlson, 1989; Dodge, Bates, & Pettit, 1990; Feldman & Downey, 1994; Huesmann, Eron, Lefkowitz, & Walder, 1984; Malamuth, Sockloskie, Koss, & Tanaka, 1991; Straus, Gelles, & Steinmetz, 1980; Widom, 1989). This makes them more vulnerable to negative peer pressures and more apt to engage in behaviors, like sex or drug use, to compensate for physiological, social or emotional deficiencies.

The Role of Ineffective Parenting

Adolescent risk-taking is influenced additionally by the type of parenting that youth receive prior to and during adolescence, with the cumulative impact of poor or ineffective parenting further escalating the risky developmental trajectories of early starters, and contributing to the cascade of developmental deficiencies and impairments that make association with and vulnerability to risk-taking peers more likely. Several studies have shown that adolescents who are raised in homes characterized by authoritative parenting (i.e., parenting that is warm but firm) are more mature and less likely to engage in risk-taking behavior (Baumrind, 1985; Maccoby & Martin, 1983; Steinberg, Darling, Mounts, & Dornbusch, 1994). The specific parenting behaviors required to achieve the balance of parental support, maturity demands and control reflected in the authoritative style are complex and require subtle shifts over time as children's developmental needs change. Dimensions of effective parenting include: 1) parental nurturance, or a level of emotional warmth, support, and demonstrated acceptance (versus rejection) and appreciation of the child; 2) active interest and involvement in the life of the child (versus mild or extreme forms of neglect); 3) clear, reasonable expectations and standards for appropriate behavior with explicit rules and consequences for transgressions (versus low levels of demands or excessive attempts to control behavior); 4) effective monitoring or supervision of the child's activities and peers.

Research studies that assess these aspects of effective parenting report reliable negative associations between them and a broad array of high risk behaviors, including aggressive, hostile, oppositional, and delinquent behavior; use and abuse of alcohol and illicit substances; initiation of sex, failure to practice safe sex, and involvement in a pregnancy at an earlier age (Ary, Duncan, Duncan, & Hops, 1999; Baumrind, 1991; Fleming, Kim, Harachi, & Catalano, 2002; Galambos, Barker, & Almeida, 2003; Jackson, Bee-Gates, & Henriksen, 1994; Rothbaum & Weisz, 1994; Shedler & Block, 1990; Steinberg et al., 1994). While most studies have focused on maternal parenting to the exclusion of fathers, emerging evidence suggests maternal and paternal influences are both important (Lamb, 2003).

Although child effects and passive gene-environment correlations account for some of the effects of parenting (Deater-Deckard, 2000; Ge et al., 1996; Goodman & Stevenson, 1991), evidence also supports environmentally mediated effects. Studies also indicate differing relative contributions of genetic and environmental influences based on age. In research on antisocial behavior, there appear to be stronger genetic effects in childhood, including gene X environment interactions. During adolescence, genetic effects may decrease in magnitude, and the shared environment may exert more of an influence (Deater-Deckard, 2000). In adulthood, there is evidence for a resurgence of genetic influence. Adolescence is primarily environmentally rather than genetically mediated (Han, McGue, & Iacono, 1999), in contrast to adulthood when genetic effects on problem use are much stronger. A diminished genetic effect in adolescence is likely due to the fact that some level of risk-taking is normative during adolescence and is driven more by peer social processes. Many youth will initiate risky behaviors during this period in response to immediate social pressures and opportunities (e.g., peer influence and lack of parental monitoring), and less as a result of inherited vulnerability.

Several explanations have been offered to account for parenting effects on adolescent risk-taking. Theoretically, disengaged parenting raises a risk for adolescent problem behavior because the combination of (1) a lack of emotional bonding or attachment to parents, and (2) a lack of supervision and consistent behavioral control fails to provide a clear communication of parents' values and also undermines motivation for adolescents to attend and comply, thus weakening adolescents' internalization of parental values and socialization (Baumrind, 1991; Grusec & Goodnow, 1994). Highly supportive and responsive caregiving, particularly when combined with clear and consistent discipline, also facilitates the gradual increase in children's self-regulatory capacities and decision-making abilities (Martin, Maccoby, & Jacklin, 1981; Shaw, Keenan, & Vondra, 1994).

Evidence suggests that the parenting context begins to shape pathways to adolescent risk-taking very early in development. Keenan and Shaw (2003) explain development of antisocial behavior as the

result of both individual deficits in the capacity to regulate emotions and behaviors (stemming from genetically-linked vulnerabilities previously described) and a caregiving environment that exacerbates these deficits by not providing the appropriate level of developmental guidance in important socialization processes. Contingent and sensitive responding in infancy and early childhood provides a foundation for caregivers to facilitate development of self-regulatory skills (Martin, Maccoby, & Jacklin, 1981; Shaw, Keenan, & Vondra, 1994) and internalization of moral standards (Kochanska, 1995), and also sets the stage for parents to have greater impact in middle childhood and adolescence.

As youth enter early adolescence, continued support and involvement and, particularly, their knowledge and supervision of adolescents' activities are important to help manage children's experiences with peers and their expanding time spent outside the family. During elementary and middle school, parents can directly manage peers to a certain extent by actively steering their children toward desired peers and activities (Parke & Ladd, 1992). How much parents attend to their younger children's activities, their friends, and specifically their opportunities for substance use has a strong impact on preadolescents' beginning drug use (Chilcoat & Anthony, 1996). In mid to late adolescence, parents have much less influence to directly structure peer group affiliation. However, adolescents differ considerably in their susceptibility to peer influence, and one of the most important contributors to this differential susceptibility is the quality of parenting and the parent-child relationship. Adolescents whose parents are authoritative (i.e., when parents are involved, make demands, and supervise while demonstrating acceptance and warmth) are less swayed by peer pressure to misbehavior than are adolescents whose parents are overly permissive or authoritarian (Fuligni & Eccles, 1993; Mounts & Steinberg, 1995). Parents that are either too harsh or controlling, or not involved at all (neglectful), may cause youth to be overly focused on peers as a way to address their unmet needs for acceptance and belonging. Research also shows that teens are more willing to tell their parents about their whereabouts and activities if they have a strong parent-child bond (Kerr & Stattin, 2000), and the

presence of strong bonds with parents and other family members moderates the negative influence of peer drug use and delinquency (Farrell & White, 1998; Germán, Gonzales, & Dumka, 2009; Mason, Cauce, Gonzales, & Hiraga, 1995; Wills & Cleary, 1996).

This period is also marked by reciprocal influences between the adolescent and parents' supervision. Kerr and Stattin (2000) have reported that deviant-behaving adolescents are especially difficult for parents to monitor and supervise, and thus their monitoring behaviors may appear to be incompetent. No doubt, adolescents influence what their parents know about them. But Fletcher, Steinberg, and Williams (2004) distinguished between parental knowledge supplied by the adolescent and parental supervision and found that parental supervision exerts an exogenous influence over the adolescent's behavior. Thus, the parent and adolescent influence each other in an ongoing battle over parental oversight of adolescent behavior.

Family Modeling and Socialization of Risk-taking Behaviors and Values

The family context also provides socialization specific to risk-taking behaviors through modeling (e.g., parent or sibling involvement with drugs and alcohol), transmission of family values and attitudes that are favorable or prohibitive of risk-taking (Johnson & Pandina, 1991), and communication about topics such as adolescent sexuality, drinking and drug use (Chassin et al., 2005; Webster, Hunter, & Keats, 1994; Kotchik, Shaffer, Forehand, & Miller, 2001). For example, in addition to modeling alcohol use and alcohol expectancies through their own drinking, parents increase the likelihood of their child's drinking through having alcohol available and accessible in the home and, in some cases, through active encouragement of child experimentation with alcohol (White, Johnson, & Buyske, 2000). At the other extreme, family members may engage in explicit communication to educate youth about the perils of risk-taking and discourage their involvement.

Although the potential benefit of parenting practices to reduce risk-taking has been of interest in the literature, findings have been notably weak and inconclusive. Numerous cross-sectional studies and a

few longitudinal studies have found parental practices, such as talking about sex, or family attitudes and rules that discourage different types of risk-taking, like smoking, can reduce these risky behaviors. However, an equal number of studies find no effects or even contradictory effects (Chassin, et al., 1995; Fisher, 1989; Miller, Benson, & Gailbraith, 2001). One possible explanation is that findings may vary depending on when communication is initiated (e.g., before or after parents discover their children are sexually active or using drugs), the quality of the parent-child relationship, or the family values and models available in the household. For example, two studies found that parent attitudes and parent specific socialization strategies to reduce smoking (rules, punishment and prohibitions against smoking) prospectively predicted adolescent smoking behavior, but not in homes in which parents smoked (Andersen et al., 2002; Chassin et al., 1995); when family members are actively using, these socialization strategies have had paradoxical effects to increase adolescent smoking (Chassin, et al., 1995; Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001). Rodgers (1999) found an interaction between parental support and parent-child communication, such that adolescents of less supportive parents were less likely to benefit from the protective effects of parent-child communication about risk reduction strategies. In another study, Miller, Forehand and Kotchik (2000) found that positive general parent-child communication was more strongly related to decreased sexual risk-taking than was parent-child communication about sexual topics. In general, the literature suggests that family communication and restrictions alone are not effective and that positive family relationships and parenting practices are more powerful deterrents to adolescent risk-taking (Hill, Hawkins, Catalano, Abbott, & Guo, 2005; Jackson, Henriksen, Dickinson, Messer, & Robertson, 1998)). It may be that open, supportive parent-child relationships are a necessary prerequisite for adolescents' to be susceptible to parents' advice about risky situations and consequences.

Also, there is no question that adolescents are more likely to engage in risky behaviors when these behaviors are practiced in their own homes. Research targeting alcohol use also shows that

sibling use is especially predictive of adolescent alcohol involvement; the magnitude of this relationship appears to be stronger than that observed with parental alcohol use, and it may be environmentally mediated to a greater extent (McGue, Sharma, & Benson, 1996; Rowe and Gulley, 1992). In a rare effort to tease out the genetic and environmental contributions of parents and peers, McGue et al. (1996) used an adoption design and found that parent-offspring resemblance for alcohol-related problems was genetically and not environmentally mediated; adolescent alcohol use was minimally influenced by alcohol use of adoptive parents. However, for siblings, there was evidence of an environmental effect with a significant correlation between non-related siblings on self-reported alcohol and tobacco use when they were raised in the same home. Although the specific mechanisms of peer influence have yet to be identified, studies have shown strong sibling effects on other outcomes as well, including age at first sexual intercourse and pregnancy (Ary, Tildesey, Hops & Andrews, 1993; East & Khou, 2005; Rowe & Gulley, 1992). Adolescents are most influenced, in both positive and negative ways, by siblings that are older, of the same sex, and with whom they have a close, positive relationship (Brody, 1998; East & Khou, 2005).

Family Influences in Context

Family influences on risk-taking can only be understood in light of the simultaneous influence of other socializing contexts, particularly the peer context that will be discussed in the next section, but also broader contextual conditions that add to, shape, and moderate the effect of the family (Bronfenbrenner, 1979; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Conditions such as family poverty, neighborhood violence, single parent family status, major family disruptions e.g., (divorce, death of a parent), and cumulative family adversities all have demonstrated effects to increase adolescent risk-taking (Amato & Keith, 1991; Brooks-Gunn & Duncan, 1997; Sampson, Raudenbush, & Earls, 1997). However, research has shown these factors operate, in large part, through their impact on the parenting and family processes previously described.

Conger and colleagues (e.g., Conger & Elder, 1994; Conger, Rueter, & Conger, 2000) described a chain of family disruptions that account for the well-established association between economic hardship and child maladjustment. According to family stress theory, economic pressures due to financial strain lead to disruptions in parents' personal functioning (e.g., increased depression, anxiety, anger and frustration, substance use) and in their marital relationships, and these strains diminish their ability to parent effectively (Conger, Conger & Elder, 1997; Conger et al., 2000; Cutrona et al., 2003; Parke et al., 2004); family stress processes have been validated across diverse populations (Barrera, et al., 2002; Brody et al., 2001; Conger et al. 2002; Conger et al., 1997; McLoyd, 1990; Parke et al., 2004). Research on neighborhood effects has shown similar disruptions in family relationships and parenting due to the stress of living in economically disadvantaged, dangerous neighborhoods (Sampson et al., 1997; Gonzales et al., in press; Rutter & Quinton, 1977). Likewise, the negative impact of divorce is largely driven by the effects of loss or separation on marital conflict, hostility, and poor parenting in families that eventually experience divorce, with little risk from loss or separation if these family disruptions do not occur (Amato & Keith, 1991; Harris, Brown, & Bifulco, 1986). When these conditions are set in motion, whether due to divorce, poverty or other family adversities (often more than one), they exacerbate existing child vulnerabilities and the social mediation of genetic risk is enhanced (Reiss & Leve, 2007). For example, twin and adoption studies have found that parental harsh discipline is more likely to occur in response to heritable child traits when parents have legal or psychological difficulties, or a troubled marriage (Riggins-Caspers, Cadoret, Knutson, & Langbehn, 2003; Ulbricht, Neiderhiser, Ganiban, & Button, 2006).

Cultural Variation in the Effects of Parenting. Theoretical models linking contextual risk, family influences and risk-taking outcomes generally have been supported across diverse samples. However, some studies have reported that parenting styles and behaviors relate differently to children's adjustment depending on the broader contexts in which these behaviors are situated, suggesting that

the effects of parental discipline are not entirely universal (Florsheim, Tolan, & Gorman-Smith, 1996; Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000).

The use of physical discipline (spanking) consistently predicts increased externalizing for European American children and adolescents but effects are not as consistently shown for African Americans (Deater-Deckard, Dodge, Bates, & Pettit, 1996); in one study, physical discipline increased fighting for European American children but had the opposite effect for African Americans (Gunnore & Mariner, 1997). In order to understand these differences, it is necessary to consider that physical discipline is more normative in African American communities (Giles-Sims, Straus, & Sugarman, 1995) where parents perceive the need to exert extra efforts to protect youth from high risk neighborhoods and other contextual threats to positive development (Burton, 1991; Furstenberg, Eccles, Elder, Cook, & Sameroff, 1999). Deater-Deckard and Dodge (1997) propose that the “cultural normativeness” of physical discipline alters the impact of discipline, because it influences the experience and meaning of discipline to the child. They also suggest that some African American parents administer physical discipline in a calm, controlled fashion which may also reduce its negative impact. In an international study of families from 5 culturally distinct countries, Landsford et al. (2005) reported evidence that perceived normativeness of physical discipline attenuates the association between experiencing physical discipline and child aggression and anxiety. Recent findings also suggest that the negative effects of physical discipline are dampened when delivered in the context of a supportive parent-child relationship (Deater-Deckard, Ivy, & Petrill, 2006; McLoyd & Smith, 2002; Simons, Wu, Lin, Gordon, & Conger, 2000).

Cultural variations in parenting effects have also been reported with Asian Americans for whom the positive impact of authoritative parenting and the negative impact of authoritarian parenting (an approach characterized by high demands, strict discipline, and unquestioned parental authority) on academic and psychological functioning are not consistently found as it is among White Americans (Chao, 2001; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Steinberg, Dornbusch, & Brown,

1992). It has been posited that Asian American adolescents may interpret and experience parenting differently from mainstream White American adolescents due to culturally-linked differences in parenting and child-rearing norms within traditional Asian cultures (Chao & Aque, 2009).

Although few studies examine cultural and contextual effects, and even fewer directly examine the cultural underpinnings of group differences when found, these findings raise the possibility that social contexts within, as well as beyond, the family may influence the meaning ascribed to a disciplinary tactic, thus varying its effect. However, it is important to note that none of the extent findings on cultural variation have yet to refute the central importance of parenting and the need for strong, positive parent-child bonds coupled with effective disciplinary strategies that are sensitive to the realities of children's daily lives. Rather, what has been challenged is the universality of the specific behaviors or cultural styles that families use to achieve these ends.

V. Peer influences

Positive Influences of Peers

Although peers are typically cast as solely negative agents in adolescent development, the fact is that the peer group as a context and specific peers as relationship partners exert mostly positive influence on adolescent development (Brown et al., 2008). Peers provide normative regulation (Eder, 1995) which defines, clarifies, maintains, and enforces norms for behavior in dyadic and group settings. Peers also provide a staging ground for the practice of social behaviors, leading to social cognitive competence, and experimentation with roles, leading to identity development.

Peers influence youth in at least four different types of relationships. These relationships operate mostly positively but are also the contexts for deviant development. *Dyadic friendships* afford opportunities for the development of skills in reciprocation, turn-taking, and cooperation. Trust and security develop here, just as they do in parent-infant relationships. *Romantic relationships* have some similarities to dyadic friendships but also enable the learning of cross-sex norms and intimacy. *Peer*

group interaction enables the development of deference, respect, and understanding of status.

Adolescents may find themselves at the top, middle, or bottom of a dominance hierarchy that depends on context-specific competence in athletics or academics or on income. Adolescents might also be popular, rejected, neglected, controversial, or average among their peer group (Kupersmidt & Dodge, 2004). Finally, the broader *peer culture* exerts influence through presentation of values, attitudes, and behaviors in the media.

Deviant Peer Influences in Naturally Occurring Group Settings

Adolescence is not only an era during which peers hold high value and exert strong influence over individual youths, it is also an era during which youths spend an inordinate amount of time with peers. The combination can be dramatic, even lethal, growth in deviant behavior when the peer context is unstructured and valuing of deviance. Measurement issues in assigning peers as the causal agent of these influence loom, however, because of several confounds among the nature of the setting and the members within that setting. Peer effects on growth in adolescent deviant behavior have been documented in schools, neighborhoods and housing settings (Vigdor, 2006), community programs such as after-school programs and community centers (Lansford, 2006), and naturally-occurring groups such as gangs (Klein, 2006).

Schools. The peer group to which a child is exposed in school classrooms has been found to exert strong impact on that child's growth or diminution of aggressive behavior over time. Students (seemingly randomly) assigned to elementary classrooms with a relatively high ratio of aggressive peers are likely to increase their aggressive behaviors during that school year and at least several years into the future, relatively to other students (Stearns, Dodge, Nicholson, & CPPRG, 2008; Thomas, Bierman, & CPPRG, 2006; Warren, Schoppelrey, Moberg, & McDonald, 2005).

Neighborhoods. Disadvantaged neighborhoods have long been associated with deviant outcomes for adolescents (Brooks-Gunn, Duncan, and Aber, 1997a; 1997b), but deviant families might

self-select into neighborhoods populated by deviant peers. Furthermore, Manski (1993) identified an issue that he termed the *reflection problem*, which is that it is difficult to sort out whether an adolescent is influencing peers toward deviance or the peers are influencing the adolescent. Peer contagion and multiplier effects are observed if the net influence is toward growth in overall deviant behavior (Brock & Durlauf, 2001).

With these methodological issues in mind, numerous studies have examined peer effects in neighborhood settings. Chase-Lansdale, Gordon, Brooks-Gunn, and Klebanov (1997) analyzed data from the National Longitudinal Survey of Youth (NLSY) and the Infant Health and Development Program (IHDP) and found that once family factors are controlled, neighborhood peer effects on behavioral and academic outcomes persist but are modest. Halpern-Felsher et al. (1997) examined data from the Panel Study of Income Dynamics (PSID) and found modest neighborhood peer effects on educational, mental health, and teen childbearing outcomes.

Experimental evidence on the impact of peer group exposure in neighborhoods comes from the Moving To Opportunity study in which economically disadvantaged families were randomly assigned to move to new neighborhoods through housing vouchers (Kling & Liebman, 2004; Sanbonmatsu, Kling, Duncan, & Brooks-Gunn, 2007). As hypothesized by peer influence models, shortly after being assigned to move to less deviant neighborhoods, boys displayed fewer violent and other problem behaviors relative to control boys who stayed in neighborhoods of origin (Katz, Kling, & Liebman, 2001). The long-term findings are perplexing, however. As expected, girls who had been assigned to live in neighborhoods where they were exposed to fewer deviant peers experienced fewer arrests for violent, property, and other crimes, and improvements in well-being on several measures (Kling & Liebman, 2004). However, boys who moved to less deviant neighborhoods experienced more arrests and worse behavior than control boys (Kling, Ludwig, & Katz, 2005). The most persuasive finding and parsimonious explanation of this pattern (but admittedly post hoc by the authors) is one that is consistent with the

deviant peer influence hypothesis: girls in less deviant neighborhoods participated more in team sports and structured after-school organizations, whereas boys in less deviant neighborhoods returned to interact with peers from their old neighborhoods and spent time with new peers who used drugs (Ludwig & Duncan, 2006).

Unsupervised contact with peers. High levels of informal contact with peers without adult supervision during the middle school years has been found to predict growth in antisocial behavior across time, but only among adolescents who were initially at least slightly antisocial (Pettit, Bates, Dodge, & Meece, 1999). The inter-relation between peer influence and parental influence suggests, however, that the progression toward deviance starts earlier. Dishion, Capaldi, Spracklen, and Li (1995) found that ineffective parental monitoring and supervision predicted which adolescents would gravitate toward deviant peer groups. Likewise, Oxford, Harachi, Catalano, and Abbott (2001) reported that parental rules and high levels of monitoring in grade 5 reduced their children's association with deviant peers in middle school and subsequent drug use. Thus, it appears that unsupervised contact with deviant peers is the catalyst for deviant behavior, but the process starts earlier with parental supervision. This pattern in which parental factors influence peer factors which influence individual deviant outcomes has been called a dynamic cascade by Dodge et al. (2009).

Community programs. After-school youth development programs bring together peers for ostensibly positive purposes, but they also provide children with exposure to various peer groups (Lansford, 2006). Because a disproportionate number of children who enroll in these programs come from disadvantaged backgrounds and have histories of deviant behavior, these programs offer a test of hypothesis of deviant peer influences. Evaluation of a randomized controlled trial involving 18 centers (called Community Learning Centers) for elementary school children revealed that program children reported safer after school than control children, but school records indicated that program children were suspended more frequently than controls and teachers reports more behavior problems for

treatment children (U.S. Department of Education, 2003). Among middle schoolers in Community Learning Centers, experimental evidence is lacking, but analyses with statistical controls indicated that participants in these programs later had higher rates of substance use, drug dealing, and property destruction (U.S. Department of Education, 2003). Mahoney and colleagues (2001; 2004; 2005) have reached similar conclusions following analyses of publicly-funded after-school programs that aggregate deviant youths: participation in these programs increases antisocial behavior and the most likely cause is exposure to deviant peer influences.

It is misleading to characterize all peer group activities as harmful. Mahoney and Stattin (2000) reported that participation in highly structured activities with peers that are led by an adult and that meet regularly (such as sports, music, Scouts, and church) is associated with lower level of antisocial outcomes, although selection effects account for these outcomes as well as participation. A randomized controlled trial of participation in Boys and Girls Clubs (which meet regularly with trained adult leaders who follow structured curricula in addition to affording structured fun activities) found that participants showed higher levels of social competence than controls (St. Pierre et al., 2001).

Gangs. Membership in a gang is perhaps the most striking case of exposure to deviant peer influences. Longitudinal studies have revealed convincingly that entering a gang is associated with increases in deviant behavior and exiting a gang is associated with subsequent decreases in deviant behavior (Battin, Hill, Abbott, Catalano, & Hawkins, 1998; Gatti, Tremblay, Vitaro, & McDuff, 2005; Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003). Klein (2006) has described the gang process as one of peer influence that is fueled by promotion of rivalry with other gangs, group norms of loyalty and commitment to the deviant gang, and cohesiveness and group identity. These processes lead to crime amplification during gang membership.

Influence of Peers in Institutionally Structured Settings

Peer influences operate not only in naturally-occurring peer groups but also in groups that are assembled by adults for purposes of intervention. Aggregation of deviant adolescents with other deviant adolescents is the single most common public policy response to deviant behavior in education, juvenile justice, and mental health (Dodge, Lansford, & Dishion, 2006). In education, peer aggregation occurs in tracking, special education, in-school suspension, and alternative schools. In mental health, it occurs in group therapies, day-treatment programs, and residential placements. In juvenile justice, it occurs in detention centers, training schools, boot camps, and wilderness camps. Over the past decade, evidence has emerged that these well-intentioned interventions have adverse effects on participants under some, but not all, conditions, with adverse effects most likely to occur when there is enhanced opportunity for deviancy training and deviant peer group exposure (Dishion, McCord, & Poulin, 1999).

The findings do not indicate that all group interventions for adolescents are harmful, but they do point toward conditions that increase the probability of adverse impact, due to the likelihood of deviancy training. Deviancy training in intervention groups is relatively likely to occur when: 1) participants are of early-adolescent age; 2) participants have begun a trajectory toward deviance but are not extremely deviant; 3) participants are exposed to slightly older, slightly more deviant peers; and 4) the setting is unstructured and allows for free interaction without well-trained adult supervision (Dishion, Dodge, & Lansford, 2006).

Education. Analyses in each of the settings of education, juvenile justice, and mental health reveal similar iatrogenic effects when one or more of these conditions is met (Dodge, Dishion, & Lansford, 2006). In many schools in America, tracking policies segregate students according to academic ability, thus having a systematic effect on the peer group to which a student is exposed. Tracking leads to narrowed friendship choice, even when selection factors are taken into account (Kubitschek & Hallinan, 1998). Furthermore, being tracked into a lower-level group is associated with lower school

achievement and school engagement, even when controlling for initial ability levels (Bennett & LeCompte, 1990).

Using administrative data on over 100,000 public school students in North Carolina, Cook, MaCoun, Muschkin, and Vigdor (2007) found that sixth grade students attending middle schools with seventh and eighth grade peers are more likely to be cited for discipline problems and to have low end-of-grade test scores than those students attending elementary schools. This difference remains after adjusting for the socioeconomic and demographic characteristics of the students and their schools. The higher problem-behavior rates by sixth graders who are placed in middle school persist at least into high school, when all types of sixth graders have been brought together, suggesting that the impact starts a trajectory that the adolescents carries into new settings. The most plausible explanation is that exposure to older peers and the relative freedom from adult supervision that come with sixth graders' placement with older peers have deleterious consequences. Muschkin, Glennie, and Beck (2006) found that this effect is even more dramatic when classroom composition is examined. They analyzed the influence of the ratio of grade-retained peers on the propensity of seventh-graders to engage in deviant behaviors in school. Consistent with peer influence theories of adolescent behavior, they found that students who attend school with relatively many old-for-grade or retained students are more likely to commit offenses in school and to be suspended, even when all plausible statistical confounds are controlled.

The strongest peer group manipulation by schools is placement of a student into an alternative school with other deviant youths. One of the very few experiments in this domain was led by Cox (1999), who randomly assigned 83 behavior-problem middle school students to an alternative school or to remain in their traditional school. Although students assigned to the alternative school later reported higher self-esteem and better attendance than did control students (however, that gain quickly dissipated when students returned to their traditional school), students assigned to alternative schools self-reported more delinquent behaviors over time (mean score of 2.90 at pre-program, 3.07 at post-

program, and 3.20 at one-year follow-up), whereas controls reported no change over time (mean score of 2.83 at pre-program, 2.71 at post-program, and 2.83 at one-year follow-up). This difference fell just short of statistical significance, however.

Juvenile justice. Juvenile justice models that bring deviant peers together, such as guided group interaction (GGI, Empey & Rabow, 1961), positive peer culture (PPC, Vorrath & Brendro, 1985), boot camps, and wilderness camps (Greenwood, 2006) are predicated on the assumption that peer influences are powerful but can be converted to positive influence in institutional settings led by adult staff members. Unfortunately, these approaches have been found to be ineffective or, in some cases, harmful to adolescents (Greenwood, 2006; Osgood & Briddell, 2006). Few studies involve random assignment, however, and so conclusions are tenuous. A highly influential experiment in the field was conducted by Feldman, Caplinger, and Wodarski (1983), who randomly assigned delinquent and non-delinquent adolescents to all-deviant groups, all-non-deviant groups, or mixed groups for which only one or two delinquent youths were mixed with mostly non-delinquent peers. They found that assignment to all-deviant groups was associated with worse outcomes for delinquent youths than was assignment to mixed groups, but this adverse effect could be mitigated by a highly trained leader or a highly structured behavioral modification context that did not allow for unsupervised peer interaction.

Bayer, Pintoff, and Pozen (2003) evaluated peer influences by analyzing the post-release criminal records of almost 15,000 juvenile offenders released from institutional facilities in Florida as a function of their cellmate characteristics while in detention. For about half of the offenses that they studied, being incarcerated with peers who had committed that offense prior to incarceration was associated with an increased probability that the adolescent would be arrested for that offense post-release. The peer influence on arrest was strongest for felony drug crimes, burglary, and felony weapons charges. The peer influence effect held mainly for those adolescents who had had at least some prior experience with that offense (that is, peers did not lead an adolescent to a new crime domain but

significantly exacerbated crimes in a domain for which the adolescent had at least some experience), for younger adolescents, and for adolescents who were placed with slightly older peers.

In juvenile justice, a common approach to delinquency diversion for early offenders is counseling, which is administered in either individual or group format (Lipsey, 2006). Lipsey (2006) conducted a meta-analysis of these programs and found that the positive mean effect size of .12 for individual counseling was significantly reduced by a third to .08 when counseling was administered in groups of offending peers. Furthermore, this diminution of treatment effect was larger for early adolescents than for later adolescents.

Mental health. Treating adolescents for mental disorders has commonly occurred in groups, because of both a theoretical rationale that peer interaction fosters positive development and a practical consideration of cost. Individual randomized trials provide compelling evidence of the potential for adverse effects of placing deviant adolescents with each other. Dishion and Andrews (1995) randomly assigned 158 11- to 14-year-old high-risk boys and girls to a peer group intervention, a parent group intervention, both interventions, or a control condition. Within one year, adolescents who had been randomly assigned to one of the two peer group conditions had higher teacher reports of conduct problems and self-reports of tobacco use than adolescents in the parent intervention or control condition. The findings persisted at the two-year and three-year follow-ups (Dishion, McCord, & Poulin, 1999).

Meta-analyses have shown that positive effects of therapies are offset by group administration and sometimes become iatrogenic when the group consists of deviant peers who influence an adolescent adversely. Ang and Hughes (2002) meta-analyzed social skills training interventions for children with conduct problems and found that the positive effect size (.64) for individual treatments was reduced to .41 when the administration occurred in groups with deviant

peers. Dodge and Sherrill (2006) have summarized the several dozen studies that report adverse effects of peer group intervention on mental health outcomes in adolescents.

Two randomized trials in foster care address the role of deviant peer influences and the potential for parenting influences to counteract these forces. Multidimensional treatment foster care (MTFC) is a manualized intervention for foster parents of conduct-problem adolescents, which focuses on close monitoring and supervision by the foster parents so that the adolescent cannot spend unsupervised time with deviant peers. In the first trial, boys assigned to MTFC had significantly lower official and self-reported delinquency at 12 month follow-up and lower violent offending at 24-month follow-up than control boys (Chamberlain & Reid, 1998; Eddy, Whalen, & Chamberlain, 2004). The second randomized trial showed that MTFC girls had fewer adult-reported delinquent behaviors at 12-month follow-up (Leve & Chamberlain, 2004). The role of deviant peer influences has been identified through mediational analyses by Eddy and Chamberlain (2000), who found that random assignment to MTFC significantly reduced deviant peer association, which in turn was associated with official and self-reported delinquency. Reductions in deviant peer associations accounted for 94% of MTFC's impact on official delinquency and 63% of its impact on self-reported delinquency (Osgood & Briddell, 2006).

Social Mechanisms of Influence

Peer influence occurs through many modes and can occur directly or diffusely, and intentionally or unintentionally (Brown et al., 2008). Multiple peer influences operate simultaneously, and the process is a reciprocal transaction. Dishion and Dodge (2006) described an ecological framework for understanding peer influence processes at several levels, from the individual cognitive level (where self- and other-labeling and related perceptual processes operate) through microsocial interactions with peers to broader cultural influences that operate on individual behavior through neighborhood conditions, organizational characteristics, and learning conditions that peers afford in schools.

The most detailed description of microsocial peer dynamics has been provided by Dishion's observations of peer group conversations which have been coded and subjected to sequential analysis (Dishion, Capaldi, Spracklen, & Li, 1995). This work has led to the deviancy training model (Dishion, Piehler, & Myers, 2008). This model starts with reinforcement theory, in which attention and rewards are given to individuals for their deviant talk. The deviancy training process consists of contingent, positive responses (e.g., laughter, smiles, verbal praise) for talk about engaging in deviant behavior. These responses to deviant talk are tantamount to reinforcement of the deviant behavior itself. In prospective analyses of 206 13-year-old boys who had been videorecorded conversing with their best friends, Dishion's group found that high rates of deviancy training processes predicted growth in substance use, delinquency, and violent behavior. Furthermore, deviancy training mediated the continuity and growth in antisocial behavior after controlling for past behavior (Patterson, Dishion, & Yoerger, 2000). As predicted by the matching law, adolescents whose friendships were characterized by deviancy training were more likely than others to continue antisocial behavior ten years later into adulthood (Dishion, Nelson, Winter, & Bullock, 2004).

Characteristics of the peers, such as salience and status (Cohen & Prinstein, 2006), and characteristics of the relationship, such as timing and power dynamics (Burton, Ray, & Mehta, 2003; Crosnoe & Needham, 2004), alter the likelihood and impact of peer influences.

Peer pressure is the most commonly assumed mode, in which peers exert direct attempts to impose attitudes or behaviors that can be either negative or positive. *Behavioral displays* provide models that are reinforced directly or vicariously through processes of social learning (Bandura, 1969). *Antagonistic behaviors* include teasing, ridicule, bullying, and intimidation. *Behavioral reinforcement* occurs through verbal and nonverbal cues of interest, agreement, and approval for certain behaviors over others. Granic and Dishion (2003) observed peer conversation patterns and identified "deviant talk" as a process through which peers reinforce antisocial behaviors. *Structuring opportunities* operate

indirectly by facilitating behaviors through exposure, such as when a peer brings a youth to an unchaperoned party or when a member of a gang is exposed to lucrative drug markets (Thornberry et al., 2003).

Not all adolescents are equally susceptible to peer influence (Steinberg & Silverberg, 1986), and adolescents who are especially prone to influence have been labeled as having an “extreme peer orientation” (Fuligni, Eccles, Barber, & Clements, 2001; Goldstein, Davis-Kean, & Eccles, 2005). Allen, Porter, and McFarland (2006) found that adolescents who are highly susceptible to peer influence are at elevated risk for a variety of maladjustment outcomes including risky behaviors, friendship instability, and depression.

Cognitive Mechanisms of Peer Influence

The processes through which peers influence an adolescent occur through social interaction as described above but are mediated through social cognition. Gibbons, Pomery, and Gerrard (2008) suggest that the influence of peers can be understood through analysis of processes in decision-making. Theories of reasoned action (Fishbein & Ajzen, 1975) maintain that the probability of a behavior (such as substance use or participation in a team sport) depends on judgments of its costs and benefits. If peers hold high value among adolescents, then peers influence behavior by influencing an adolescent’s perceptions of the costs and benefits of engaging in a behavior. When confronted with an illegal substance at a teen party, an adolescent weighs the various benefits of using the substance (perhaps high peer reward, high sensation value, and physiological pleasure) against the costs (perhaps risk of adult sanction, damage to one’s body) and generates a decision called behavioral intention (BI). Peers influence these judgments by offering direct reinforcement for behaviors as well as by biasing perceptions about reinforcement. Furthermore, Fontaine and Dodge (2006) differentiate between the value placed on an outcome (“How much would you like being congratulated by peers?”) and the

evaluation of the likelihood of that outcome occurring given a behavior (“How likely is it that peers would congratulate you if you acted this way?”).

Gibbons, Pomery, and Gerrard (2008) suggest that the reasoned action account of behavior must be supplemented by an understanding of the subtleties of adolescent peer transactions, one of which they call behavioral willingness (BW). BW is defined as an openness to a risk opportunity. When questioned in a laboratory about the costs and benefits of a deviant behavior such as substance use, an adolescent may be likely to express low BI for substance use. It is well known that context exerts powerful influence over this judgment, though, such that if questioned while at a party among imbibing peers, the decision may shift toward substance use. An intervening decision is whether to attend the party in the first place, called BW. Adolescents display high BW, which means that they are ready to decide to enter contexts in which their decisions may shift. Pomery, Gibbons, Reis-Bergan, and Gerrard (2009) have found that behavioral outcomes among young adolescents are more strongly predicted by BW than by BI and that the shift toward stronger reliance on BI over BW does not occur until about age 17 or 18, which roughly corresponds to the age when both peer conformity and risk preference begin to decline as well. Finally, it is likely that individual differences in BI and BW are based in temperament and related biological factors, and these factors interact with peer processes across adolescence.

Peers can influence individual decision making processes even without direct interaction. Prinstein and Wang (2005), for example, found that adolescents tend to over-estimate the problem behavior of their peers. To the extent that an adolescent seeks favor with the peer group, she or he may try to emulate the kind and level of problem behavior that she or he believes occurs. Given the high sensation value and salience of deviant talk in peer interactions (Dishion, Spracklen, Andrews, & Patterson, 1996), these over-estimates may be self-perpetuating.

VI. Final Synthesis

Although research on risk-taking has shifted to a greater focus on genes and neuroscience, the family and peer contexts remain central to explain how inherited vulnerability intersects with biological and neuroregulatory maturation to influence propensity for risk-taking in adolescence. In the past 25 years, there has been remarkable convergence across studies that identify the core set of family influences described in this paper; evidence is strongest in support of coercive, hostile family processes and ineffective parenting. Research suggests these family influences are involved in the crucial interplay between genetic propensity and environmental risk, including passive, evocative, and active genotype-environment correlations. These influences unfold across development, beginning early in life, are accelerated by the presence of ecological risk (e.g., high risk neighborhood, poverty, single parent families), and lead over time to heightened susceptibility to multiple problem behaviors and the social influence of risk-taking peers in adolescence.

Mounting evidence from randomized clinical trials (RCTs) of interventions that specifically target family interactions and parenting behaviors at different stages of development, including in infancy, middle childhood, and early adolescence, have reported long-term effects to prevent or reduce risk-taking in mid to late adolescence (e.g., Brody et al., 2006; DeGarmo & Forgatch, 2005; Pantin et al., 2003; Sanders, 2008; Webster-Stratton & Taylor, 2001; Wolchik et al., 2002). For example, in a number of RCTs of a home visiting intervention initiated during pregnancy (Olds, 2002), mothers show improvements in maternal caregiving, and reduced physical abuse, aggression and harsh parenting in the first five years of the child's life. In a trial with children of poor, unmarried women, Olds et al. (1998) reported long term effects at age 18 on running away, arrests, number of sex partners, tobacco and alcohol use and behavioral problems related to use of drugs and alcohol. Several meta-analyses of parenting interventions also provide compelling evidence that interventions implemented in childhood can offset the cognitive and emotional developmental risks associated with family stress and that children who demonstrate the most profound early deficits show the greatest improvements (O'Connell,

Boat, & Warner, 2009). Family focused interventions that improve parent-child relationships and parenting practices in mid childhood and early adolescence also demonstrate long term effects to reduce adolescent substance use (Spoth, Redmond & Shin, 2001) and risky sexual behavior (e.g., early debut, number of partners, unprotected sex; Brody et al., 2006); in some cases the latter effect is shown even when a program does not specifically target sexuality (Wolchik et al., 2002) and in contrast to youth focused interventions that have targeted these outcomes but have generally not been effective. Thus, family-focused RCTs offer robust support that family influences are critical to reduce risk-taking in adolescence and that the family social context is important for altering trajectories for those most at risk. What is not as well established is the extent to which family influences can account for risk-taking in the absence of ecological or heritable risk. The answer to this question likely lies in the crucial interplay between family influences and peer influences, and the way in which risk-taking is accelerated when both contexts operate in concert to propel youth toward risk-taking.

Research summarized herein has identified the developmental forces and settings through which peers influence adolescent risk-taking, suggesting that some risk-taking is normative, biologically driven and, to a certain degree, an inevitable outcome of increased salience and time spent with peers during adolescence. Evidence also shows that two peer conditions, in particular, can serve as a catalyst for risk-taking and other forms of deviant behavior - unsupervised peer groups and peer groups constituted by a greater number of deviant peers; the latter often occurring as a result of well-intentioned policies and practices for managing youth. The literature highlights the influence of peers' behaviors and attitudes on an adolescent, most likely through processes of deviancy training, modeling, and reinforcement. A relative gap in the literature concerns the way in which qualities of adolescent peer relationships (e.g., reciprocation, mutual support) affect development.

Moreover, peer influences do not operate independently but remain interconnected with family influences in complex ways. Family and peer influences operate sequentially, competitively, or in a

compensatory fashion at different stages of development. Dodge et al (2009) describe a cascading pattern in which early parental factors (low warmth, high harsh discipline) influence peer factors (low social competence and high peer social rejection), which subsequently influence parental reactions (withdrawal of supervision and monitoring due to conflict), which influence peer affiliations (gravitation toward deviant peers due to low parental supervision), which influence substance-use behavior. Dodge et al. (2008) describe a similar dynamic cascade in the development of adolescent violence. In this model, a risky family context leads young children to lag in their social, cognitive and emotional development, so they are ill-prepared to develop positive, prosocial relationships and are lacking in regulatory skills and coping abilities to make good decisions when faced with risky choices. Social incompetence leads to social rejection by peers and aggressive conflicts with peers. In turn, parents respond to a conflict-ridden child by withdrawing supervision and monitoring, even though these children may be the ones who need the high structure of supervision more than other children. Lack of parental supervision of a dysregulated adolescent increases risk for affective disturbance and the use of risk-taking, particularly alcohol and drugs, as a form of self medication, seeking of peer approval, or enjoyment. In this model, the family plays a central role early in development, with a shift to greater influence of peers in adolescence. However, even during adolescence, the family remains important because it provides a source of supervision, guidance, and protection. Hawkins et al. (1992) have proposed that strong bonds between an adolescent and his or her parents reduce the likelihood of problem behaviors and substance use because of its effect on reducing the salience and value of peer influences, and vice-versa. Efforts of parents to monitor, structure and limit peer activities are also important to delay or reduce exposure to risky peer contexts, which may be especially important during early adolescence when youth are most vulnerable to heightened reward processing coupled with a still immature self-regulatory system.

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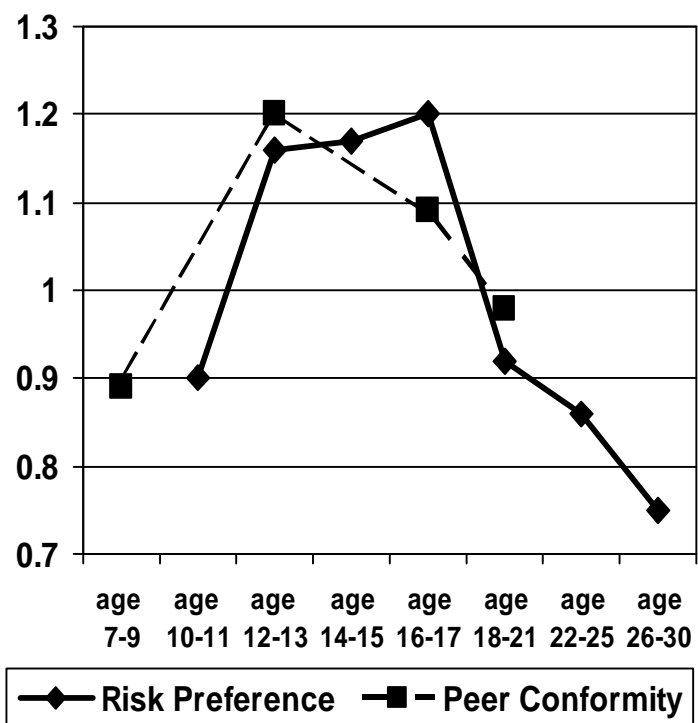
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Figure Captions

1. Peer Conformity and Risk Preference Peak in Adolescence. (Peer conformity data taken from Costanzo & Shaw, 1966, with a constant of .4 added. Risk preference data taken from Steinberg, 2009.)



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