PATTERNS OF RULE-VIOLATING BEHAVIOR
IN CHILDREN AND ADOLESCENTS

DISSERTATION

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ABSTRACT

This study examined the influence of individual, family, and environmental factors on the development of rule-violating behaviors over time among 508 children and adolescents and their parents drawn from a longitudinal study of bereavement and depression. Participants ranged in age from 5-17 [M(SD) = 11.4(3.2)] at study entry; 52% were male, and 98% Caucasian.

Hierarchical multivariate multilevel models were created to measure the effect of individual, family, and environmental factors on participation in rule-violating behaviors over five repeated assessments. Interaction effects were also examined. Overall reported unruly behavior, alcohol use, drug use, and sexual activity were quite low, but strongly correlated. Parent and child reports of behavior were correlated, but parents reported less substance use and sexual activity, and more unruly behavior overall.

Significant differences were found in the models for the four dependent variables. No sex or SES differences were found, with the exception of reported sexual activity, which was higher among girls and older adolescents. Use of alcohol was greatest among those with normative pubertal development. Sensation seeking predicted increased unruly behavior and alcohol use. Impulsivity predicted more unruly behavior in younger children, but had no effect for older adolescents. Depression significantly predicted more
unruly behavior, but effects on alcohol use and drug use interacted with age and differed for parent and child report. Conduct disorder (CD) symptoms were linked with increased sexual activity, and predicted greater alcohol use and more unruly behavior among older adolescents. CD symptoms predicted more drug use among depressed youth, but decreased drug use in non-depressed participants. Older adolescents living in two-parent households at study entry reported less alcohol use. Parent psychopathology predicted greater sexual activity. Positive family functioning predicted decreased unruly behavior and drug use, and healthy parental marital relationships predicted less unruly behavior. Exposure to psychosocial stressors and significant life events predicted more overall unruly behavior and drug use. Involvement in family activities protected against alcohol use and unruly behavior in the presence of psychosocial stressors. Parental marital conflict increased the risk for drinking, but only in the presence of psychosocial stressors. Implications and directions for future study are discussed.
Dedicated to my family.

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CHAPTER 1

INTRODUCTION

Adolescence has long been viewed as a time of transition from childhood to adulthood. For most adolescents, this is a time of exploration and identity formation. Relationships with peers become increasingly important, while those with parents evolve into a more mature form, permitting greater responsibility and freedom for the adolescent. For some teens, however, adolescence is a period characterized by increased risk-taking, norm violations, and even delinquency. Irwin defines risk-taking behavior as volitional actions in which the outcomes are uncertain, with the possibility of an identifiable immediate or future negative effect on health (Irwin, 1993). Adolescents participate in risky behavior at much higher rates than adults, and many adolescent health problems are associated with preventable behaviors. Substance use and sexual activity generally begin in early adolescence and can pose great health risks for adolescents. Alcohol-related motor vehicle injuries are a leading cause of death for 15-24 year olds, and the risk for sexually transmitted diseases is highest in late adolescence (Irwin & Millstein, 1991). While a minority of adolescents participates in delinquent behavior that represents serious violations of societal norms and laws, most adolescent problem behavior consists of rule-violations that would not be considered deviant if engaged in
after the onset of adulthood. Given the potential costs of risk-taking in adolescence, it is important to understand the factors that predict involvement in rule-violating behaviors.

*Theories of Adolescent Problem Behavior and Risk Taking*

Various theories have been proposed to explain the increase in rule violating behavior during adolescence. One viewpoint states that risk taking is part of normal adolescent development. It is prevalent in all racial and ethnic groups and socioeconomic levels, although some gender and racial differences in the patterns of behavior exist (Irwin, 1993). In moderation, seeking out new experiences and taking risks are associated with developing initiative, higher self-confidence, and increased stress tolerance (Baumrind, 1987). Experimentation can be adaptive as adolescents work to establish autonomy and gain peer acceptance (Jessor, 1992). Behaviors are generally considered problematic when they occur prematurely or when the frequency or intensity of involvement falls outside the norm. For example, sexual activity is considered problem behavior when it is initiated during early adolescence, but is more normative during late adolescence and early adulthood (Graber, Brooks-Gunn, & Galen, 1998; Leitenberg & Saltzman, 2000; Miller-Johnson et al., 1999). In addition to early sexual activity, substance use and delinquent behavior are often the focus of concern by parents and educators.

Many different types of rule-violating behavior are strongly correlated, suggesting a "syndrome" of related risk behaviors in which involvement in one activity increases the probability of engaging in others as well. Significant correlations have been found between use of cigarettes, marijuana, alcohol, early sexual intercourse, early parenthood, violence, and suicidal ideation. Mild involvement in one type of rule violation often
leads to increasing involvement in a variety of behaviors (Arnett, 1998; DiClemente, Ponton, & Hansen, 1996; Donovan, 1996; Flisher et al., 2000; Irwin & Millstein, 1991; Leitenberg & Saltzman, 2000; Miller-Johnson et al., 1999; Rome, Rybicki, & Durant, 1998; Stouthamer-Loeber & Wei, 1998; Woodward & Fergusson, 1999). Additionally, the developmental sequence and risk factors for different behaviors may be similar. Activities including substance use, unsafe sexual behavior, and delinquency all increase in frequency and intensity during adolescence, peak in late adolescence to early adulthood, and then decline (DiClemente et al., 1996). This pattern exists across cultural groups, although differences in incidence rates may be dependent on the opportunity to engage in certain activities and the sanctions operating within a society (Gottfredson & Hirschi, 1994). It has been suggested that the different types of rule-violating behaviors be regarded as conceptually equivalent and part of a general problem behavior factor, with shared motivating factors (e.g., social acceptance, feelings of autonomy) as well as possible common etiology, precipitating factors, and outcomes (Farrell, Kung, White, & Valois, 2000; Gottfredson & Hirschi, 1994; Igra & Irwin, 1996; Jessor, 1992; Woodward & Fergusson, 1999).

Although it may be useful to think of a common risk-taking factor, individual behaviors also have unique characteristics and correlates (Anderson et al., 1993; Stouthamer-Loeber & Wei, 1998). Some risky activities (e.g., skateboarding or snow skiing) are thrill seeking behaviors, while others (e.g., underage drinking or speeding) may reflect rebellious or reckless tendencies (Gullone, Moore, Moss, & Boyd, 2000). Rather than focusing only on the expression of general rule-violating behavior, attention should also be paid to the interaction of different types of risk behaviors. The pattern of
behavior over time is important, as some research suggests differences in etiology for youth who engage in different trajectories of behavior (i.e., age of onset and persistence of behavior over time) (Guo, Chung, Hill, Hawkins, Catalano, and Abbott, 2002; Moffitt, 1993; Taylor, Iacono, & McGue, 2000). Additionally, behavior problems may result from a variety of risk factors, with multiple pathways leading to similar outcomes. These risk factors may be correlated, and the total number of risk factors present may be important in predicting problem behavior (Deater-Deckard, Dodge, Bates, & Pettit, 1998; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998). It is also important to consider the presence of protective factors, such as involvement in prosocial activities (e.g., sports, volunteer activities), personal beliefs (e.g., strong religious commitment) or social controls (parental sanctions, attitudes toward school) that reduce the likelihood of rule-violating behavior, both directly and through interactions with risk factors (Duncan, Duncan, Strycker, & Chaumeton, 2002; Jessor et al., 1995). Most prevention programs for high-risk youth focus on one or two isolated behavioral outcomes (e.g., reducing truancy, delaying the initiation of alcohol use and reducing frequency of binge drinking) (Dryfoos, 1993). Given the common co-occurrence of these behaviors, it is important to understand the relationships among multiple risk factors and address these problems concurrently.

Childhood psychopathology is often conceptualized in terms of two broad categories. Internalizing problems include syndromes such as anxiety and depression, while aggression, hyperactivity, and delinquency are categorized as externalizing problems. Much of the research on childhood behavior relies on this distinction, and many commonly used behavior questionnaires such as the Child Behavior Checklist
(CBCL) are organized in this manner (Achenbach, 1991). Many types of externalizing problems (e.g., hyperactive, impulsive and oppositional behavior) are not examples of rule-violating behavior, *per se*. Adolescent risk taking involves a decision to engage in activities that have uncertain, potentially negative outcomes, but also provide immediate benefits to the individual. While many risk behaviors fall within the category of externalizing problems (e.g., substance use, delinquent behavior), others do not (e.g., extreme sports, early sexual activity). Thus, while significant overlap exists between the categories, and although children with externalizing problems may be more prone to rule violations than those with internalizing problems, problem or risk behavior is not simply a subset of externalizing behavior.

*Risk and Protective Factors for Involvement in Rule-Violating Behavior*

*Individual Factors*

Many theories point to the importance of individual characteristics in predicting involvement in rule-violating behavior. High levels of sensation seeking and impulsivity have been associated with risk taking. Some adolescents may have a low baseline level of arousal, and therefore develop a need for intense sensory experiences. These adolescents may participate in dangerous behavior in order to obtain an optimal level of stimulation (Farley, 1981; Zuckerman, 1994). Other adolescents may be so focused on the anticipated short-term benefits of the activity that they do not respond to the possibility of immediate or long-term negative outcomes (Irwin, 1993). Involvement in rule-violating behavior is also associated with impairment of functioning and the presence of psychopathology, including mood disorders, anxiety disorders, and disruptive disorders (Flisher et al., 2000; Zeitlin, 1999). Children with comorbid disorders are at an
even higher risk of problem behaviors (e.g., substance use), and may face more negative outcomes (e.g., suicide) (Zeitlin, 1999). The frequent presence of comorbidity creates difficulty in determining the nature of the relationships between various disorders and rule-violating behavior. Zeitlin (1999) wrote: “One issue that arises from the research literature is that the comorbid disorders are related not so much by the underlying process but by commonality of precipitating factors. Depression and conduct disorder co-exist, conduct disorder and ADHD co-exist . . . conduct disorder and ADHD may both be causative in some way in induction into substance misuse. All of these pre-dispose to depression and depression also may be followed by substance misuse” (p. 230).

**Age and puberty.** Rule-violating behavior begins to increase in early adolescence, tends to peak in late adolescence and declines in adulthood. This trajectory is similar across different types of behavior and across cultures (Gottfredson & Hirschi, 1994). One explanation is the influence of changing societal norms. Activities that are unacceptable at early ages become more common and accepted during late adolescence. Another possible influence is the increase in opportunity to engage in risky behavior. As adolescents gain more autonomy, they are more likely to be in situations in which alcohol and drugs are available (Gottfredson & Hirschi, 1994). Physical development and puberty have also been implicated in the developmental pattern of rule violating behavior. For both males and females, early puberty is associated with earlier initiation of sexual activity, which is in turn associated with a variety of other problem behaviors (Graber et al., 1998; Leitenberg & Saltzman, 2000; Miller-Johnson et al., 1999; Stouthamer-Loeber & Wei, 1998).
Gender and rule-violating behavior. Although rates of rule-violating behavior among females have been increasing in recent years, they remain much lower than that of males. Females are three to four times less likely to participate in delinquent behavior than males. Conduct disorder and delinquency often have a later age of onset among girls (Kazdin, 1995; Lahey et al., 1999; Silverthorn & Frick, 1999). Males and females also display different patterns of behavior, with females tending to commit fewer violent and aggressive crimes (Marcus, 1999). In addition, the factors that predict behavior problems among girls differ, and are more difficult to identify than predictors of male antisocial behavior (Whitmore, Mikulich, Ehlers, & Crowley, 2000). Sexual activity is one form of risk behavior that reflects gender differences. Male adolescents participate in sexual intercourse at earlier ages, and have more sexual partners than females. Gender-based social pressures, in which negative perceptions of sexually active females do not apply equally to males, are thought to play an important role in this discrepancy (Graber et al., 1998). Given these established gender differences in the absolute rates of risk-taking, it is reasonable to believe that the pattern of involvement in rule-violating behavior across time will differ for females as well. Additionally the influence of individual, family, and environmental factors on rule-violating behavior may also depend on gender.

Sensation seeking. The personality trait of sensation seeking (SS) has been associated with involvement in a variety of risky activities ranging from contact sports, hang-gliding, and mountain climbing, to substance use, delinquency, conduct disorder, and casual sex (Zuckerman, 1994). Sensation seeking is defined by a preference for novel, complex, and intense sensations. High sensation seekers are thought to take risks
in order to satisfy their needs for high levels of arousal. Levels of sensation seeking are highest during adolescence, and sensation-seeking tendencies are stronger in males than females. There is evidence linking physiological characteristics to measured differences in sensation seeking. High heritability estimates for sensation seeking and correlations with measured levels of neurotransmitters and gonadal hormones suggest a biological basis for this trait (Zuckerman, 1991). Recent research has linked sensation seeking and impulsivity with specific polymorphisms of dopamine receptor genes among a sample of alcohol-dependent males (Limosin, et al., 2003). Rule-violating behavior has also been associated with physiological characteristics. Magnusson, af Klinteberg, & Stattin (1994) found that male adolescents who committed both juvenile offenses and later adult crimes displayed low autonomic reactivity and high levels of hyperactivity, motor restlessness, and concentration difficulties, while those who committed offenses only as juveniles did not show this pattern. Thus, the concept of a sensation-seeking trait with a foundation on levels of physiological arousal has validity. Some confusion exists regarding the definition and measurement of sensation seeking. Often, sensation seeking is defined in terms of a preference for risk taking, which may artificially inflate the strength of its observed relationship with rule-violating behaviors. While the current methods of measuring sensation seeking are problematic in terms of validity and methodological concerns, they reliably predict general levels of involvement in rule-violating behavior, as well as involvement in specific types of behavior, such as alcohol use or delinquency (Cooper, Wood, Orcutt, & Albino, 2003; Newcomb & McGee, 1991).

Environmental factors and socialization play an important role in determining the expression of a tendency toward sensation seeking. In cultures or families with few
restrictions on adolescents, there is great variability in the amount of rule-violating and
delinquent behavior. Within cultures that swiftly punish norm violations, sensation-
seeking tendencies are often channeled into more socially acceptable avenues. Thus,
while the full range of the trait may be present within a population, the behavioral
expression is limited by cultural norms (Arnett, 1992). In addition to strict social
controls, values that encourage academic achievement and good health, cohesive families
and neighborhoods, supportive relationships with other caring adults; and involvement in
conventional organizations like church and school groups may prevent problem behavior
(Jessor, 1992). Demographics and socioeconomic status may also affect the expression
of sensation seeking tendencies. Adolescents with an intense need for excitement and
adventure, but limited access to culturally approved forms of thrill seeking, may be at
increased risk for delinquency (Pfefferbaum & Wood, 1994). Adolescents who have
access to socially acceptable, highly stimulating activities (e.g., downhill skiing,
whitewater rafting) may be less likely to engage in delinquency than those whose
opportunities are limited by poverty or racial/ethnic marginality (Farley, 1981; Jessor,

Impulsivity. Hyperactivity and impulsivity in childhood have been correlated
with later behavior problems, delinquency, and chronic offending into adulthood
(Magnusson et al., 1994). While not a necessary component of rule-violating (some risky
activities require extensive planning and preparation), many problem behaviors contain
an element of impulsivity. Adolescents may be more willing to take risks because
uncertainty about the future leads them to focus on short-term goals while discounting the
possibility of long term negative outcomes of dangerous behaviors. Gottfredson &
Hirschi (1994) view participation in risky “deviant” behavior as a response to immediate benefits or pleasures, even at the risk of long-term cost, and suggest that the tendency to engage in such activity stems from an underlying deficit in self-control. It is possible that some adolescents take more risks than adults because they have not yet learned to control their impulses, and the optimistic bias which is often observed in adolescents is an attempt to rationalize their reckless choices (Gardner, 1993). Additionally, those with low self-control have more opportunities to become involved in deviant behaviors because they are rejected by social institutions such as schools, employers, and the military. They also self-select into environments with more deviant opportunities, and form relationships with others low in self-control (Gottfredson & Hirschi, 1994). Thus, some children may engage in high frequencies of rule-violating behaviors because they lack control of their impulses, and act without considering the possible negative consequences of their behavior.

Children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) in childhood often display high levels of impulsivity. They are at a higher risk for substance abuse and delinquent behavior in adolescence, although much of this increased risk appears to be accounted for by the high rate of comorbidity with conduct disorder (Barkley, 1998). Approximately 54-67% of children with ADHD meet criteria for oppositional defiant disorder (ODD), and 20-56% will be diagnosed with conduct disorder. Children with both ADHD and ODD engage in increased rates of antisocial behavior. Children with comorbid ADHD and conduct disorder have a much poorer prognosis than those with ADHD alone. They are at increased risk for more persistent
antisocial behavior with earlier onset that may include more substance abuse and expulsions from school, and often have family members with antisocial behavior and substance abuse (Barkley, 1998).

Conduct disorder. The diagnostic criteria for conduct disorder require that an adolescent engage in a pattern of behavior that violates societal norms or the rights of others. Thus, by definition, being diagnosed with conduct disorder is strongly associated with participation in rule-violating behavior such as substance use, risky sexual practices, and delinquent behavior. It is also associated with a continuation of rule-violating behavior in adulthood and higher rates of both substance use and antisocial personality disorders (Robins & Price, 1991). Among samples of youth with substance use disorders, 25-50% also met diagnostic criteria for disruptive behavior disorders (Armstrong & Costello, 2002). A distinction has been drawn between conduct disorder that begins in childhood (prior to age 10) and that which begins in adolescence (Aguilar, Sroufe, Egeland, & Carlson, 2000; Lahey et al., 1999; Moffitt, 1993; Taylor, Iacono, & McGue, 2000). There is evidence associating younger age of onset with more chronic, frequent and serious offenses, including more aggression. Childhood onset conduct disorder, which occurs primarily in boys, is associated with difficult temperament, impulsivity, and cognitive delays, suggesting possible neuropsychological dysfunction and stronger genetic influence. It is also strongly associated with additional diagnoses of attention deficit hyperactivity disorder and oppositional defiant disorder and a family history of antisocial behavior. Youth who develop conduct disorder in adolescence are less likely to engage in theft, vandalism, and aggression, and often report only nonaggressive behavior problems (e.g., truancy). Adolescent onset conduct disorder is associated with
less overall impairment and less frequent use of mental health services, and is less likely to continue into adulthood. Adolescent-onset conduct problems seem to reflect an exaggeration of normative behavior, and may develop in reaction to social and situational influences (Lahey et al., 1999). These adolescents do not appear to be at higher risk of engaging in adult criminal careers. Approximately 76% of boys with early-onset conduct problems become chronic offenders, while only 19% of those with late-onset delinquency experience long-term negative outcomes (Patterson, Forgatch, Yoerger, & Stoolmiller, 1998).

This dual-developmental pathway model for conduct disorder may not apply equally to both genders. Patterns of comorbidity between conduct disorder and other forms of psychopathology differ for males and females (Loeber & Keenan, 1994). Conduct disorder among girls most commonly has an adolescent onset, but the syndrome tends to resemble that of boys with childhood-onset conduct disorder. Silverthorn and Frick (1999) suggest that antisocial behavior in girls stems from vulnerability factors present in childhood (e.g., dysfunctional families, impulsivity, and difficult temperament), but symptoms are not manifest until adolescence. They state that socialization pressures from parents, teachers, peers, and internalized gender roles serve to restrain girls’ behavior during childhood. During adolescence, puberty, changing social pressures, and reduced parental supervision allow the overt expression of antisocial behavior. This “delayed-onset” form of antisocial behavior in females is associated with behavior problems that continue into adulthood, unlike male adolescent-onset conduct disorder (Silverthorn & Frick, 1999). Thus, gender is an important consideration when evaluating the impact of conduct disorder symptoms on rule-violating behavior.
Depression. Depression is associated with high-risk behavior, including substance use, delinquency, and teenage parenthood (Dryfoos, 1993; Miller-Johnson et al., 1999). Elevated rates of depression have been reported among delinquent adolescents and those with substance use disorders (Angold & Costello, 1993; Armstrong & Costello, 2002). Children and adolescents with depression use alcohol and drugs at a higher rate than non-depressed youth. Studies suggest that 20-23% of adolescents with depression will develop an alcohol or other substance abuse disorder at some time in their life (Windle & Davies, 1999). Those with onset of depression prior to puberty may be especially at risk for substance abuse, and the relationship may be stronger among females (Kovacs, Obrosky, & Sherrill, 2003; Weissman et al., 1999; Whitmore et al., 2000). Depressed adolescents who are also heavy alcohol drinkers report more childhood externalizing behavior problems, more substance use and delinquency, more stressful life events, more interpersonal problems, and lower levels of family social support than those with only one problem or with neither problem (Windle & Davies, 1999). The nature of the causal relationship between depression and substance abuse is unclear. Children with depression may be more susceptible to pressure from peers encouraging them to use substances. There may be self-medication of pre-existing depressive symptoms. Or, drug misuse may precede major depression, rather than being a consequence (Zeitlin, 1999). Alternatively, the presence of more externalizing behavior problems in these depressed adolescents suggests the possibility that comorbid conduct disorder may explain the elevated rates of substance use and other rule-violating behavior.
Depression and conduct disorder. There is a high rate of comorbidity between depression and conduct disorder in adolescence. Estimates vary widely, depending on definitions, but the literature suggests that 20% to 80% of children and adolescents with mood disorders also qualify for a diagnosis of conduct disorder (Angold & Costello, 1993; Capaldi & Stoolmiller, 1999; Pliszka, Sherman, Barrow, & Irick, 2000; Zoccolillo, 1992). Children and adolescents with comorbid depression and conduct disorder experience more negative outcomes than those with only depression. The combination of conduct problems and depression is associated with greater impairment and more unstable lifestyles. This includes more involvement in adult criminal activity, antisocial personality disorders and alcohol abuse (Harrington, Fudge, Rutter, & Pickles, 1991).

Evidence appears mixed regarding whether comorbid disorders appear before or after development of depression. Some longitudinal studies have found that conduct disorders in children develop after the onset of depression and may persist after the depression remits (Kovacs, Paulauskas, Gatsonis, & Richards, 1988). Others suggest that children may have shown symptoms of conduct problems or met criteria for oppositional defiant disorder prior to becoming depressed (Angold & Costello, 1993). Several studies, using delinquent, clinical, and community samples, found that most adolescents with comorbid disorders report the onset of conduct disorder symptoms before the mood symptoms (Loeber & Keenan, 1994; Pliszka et al., 2000; Rohde, Lewinsohn, & Seeley, 1991). Rutter, Harrington, Quinton, & Pickles (1994) suggesting that depressive symptoms may function as general nonspecific symptoms of psychopathology in children with conduct disorder, rather than as a distinct disorder. In a longitudinal study of patients from a child psychiatric clinic, children diagnosed with depression were found to
have an increased risk of developing depression in adulthood, while children diagnosed with conduct disorder were more likely to have a criminal record as an adult. Children who showed both conduct disturbance and depression in childhood were more likely to have a criminal conviction as an adult, but showed no increased risk of major depression (Rutter et al., 1994). Alternatively, a social learning interpretation suggests that symptoms of depression develop as a result of conduct disorder. Existing conduct problems interfere with a child’s ability to develop socially, emotionally and cognitively. Together, the child’s lack of competence (e.g., poor social skills, academic underachievement) and the negative reactions of others create an increased vulnerability to depression. Consistent with this hypothesis, Capaldi and Stoolmiller (1999) found that after controlling for conduct problems in a sample of 200 boys, depressive symptoms in early adolescence failed to predict a number of negative outcomes in young adulthood. Thus, while children and adolescents with depression are more likely to become involved in rule-violating behavior, it appears that much of this increase in risk taking is due primarily to the presence of comorbid conduct disorder.

Bipolar disorder. The lifetime prevalence of bipolar disorders (including bipolar I, bipolar II, and cyclothymia) is approximately 1%, with point prevalence of around 0.5% (Lewinsohn, Klein, & Seeley, 1995). Among adults with bipolar disorder, 20-40% report that onset of their symptoms occurred during childhood. As bipolar disorder often begins with a depressive episode, it has been predicted that approximately 32% of children diagnosed with depression will develop mania, and up to 20% of depressed adolescents will switch to a manic episode (Geller & Luby, 1997). The nature of the manic state itself may predispose a child or adolescent to risk-taking behaviors. For
example, children and adolescents with grandiose delusions may believe that they will not be harmed if they drive at extremely fast speeds, or that laws against stealing do not apply to them. Hypersexuality associated with mania may lead to promiscuity or unprotected sex (Geller & Luby, 1997). Up to 40% of adolescents with bipolar disorder also have a substance use disorder. Bipolar disorder with onset in adolescence is associated with a much higher risk of substance use disorder than childhood-onset bipolar disorder. The elevated risks remain even after controlling for conduct disorder and other comorbidity, suggesting that conduct disorder and bipolar disorder are independent risk factors for substance abuse (Wilens et al., 1999).

**Bipolar disorder and conduct disorder.** Despite reports of good to excellent premorbid functioning (Kutcher, Robertson, & Bird, 1998), bipolar disorder in childhood and adolescence is associated with high rates of comorbid anxiety and disruptive behavior disorders, and serious impairment of functioning (Lewinsohn et al., 1995). Childhood onset bipolar disorder, in particular, is associated with greater likelihood of additional psychiatric comorbidity (Kovacs & Pollock, 1995). The specific relationship between bipolar disorder and conduct disorder is unclear. It has been suggested that approximately 22% of children and 18% of adolescents with bipolar disorder also meet criteria for conduct disorder (Geller & Luby, 1997). However, one study followed a clinical sample of children and adolescents with bipolar disorder and found that 69% were diagnosed with conduct disorder during the twelve-year follow-up period. Within this group, the conduct disorder was equally likely to have begun before or after the onset of the bipolar symptoms (Kovacs & Pollock, 1995). It has been noted that some cases of childhood bipolar disorder may be misdiagnosed as attention-deficit hyperactivity
disorder or conduct disorder (Lewinsohn et al., 1995). Another explanation suggests that the poor judgment and grandiosity associated with a manic state may increase the likelihood of participation in problem behavior (Geller & Luby, 1997). However, Kovacs and Pollack (1995) found that bipolar disorder with comorbid conduct disorder was associated with high rates of maternal depression, paternal substance abuse and antisocial personality disorder, while bipolar disorder without conduct disorder was associated with high rates of maternal depression and mania. Thus, the impact of bipolar disorder on problem behavior may be partially mediated by the presence of conduct disorder.

Family Factors

Family factors play an important role in adolescent behavior. Adolescents with a family history of psychopathology have a greater probability of engaging in rule-violating behavior (Flisher et al., 2000; Steiner & Cauffman, 1998). Parental psychopathology may increase the likelihood of problem behaviors through direct inheritance of vulnerability to psychological problems, environmental factors associated with living with an impaired parent, or through inadequate, inconsistent parenting. Living in a single parent household has often been cited as a risk factor, and is associated with behaviors such as substance abuse and early sexual involvement (Flisher et al., 2000; Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Igra & Irwin, 1996). Other studies, however, have found that the quality of the home environment is more important than the family structure.

Poor family functioning, with high levels of conflict, low levels of cohesion and acceptance, and a lack of commitment to meaningful values, is associated with more
involvement in rule-violating behavior (Dryfoos, 1993; Flisher et al., 2000; Garnier & Stein, 1998; Igra & Irwin, 1996). The quality of parent-child interactions has an important influence on the development of problem behavior (Deater-Deckard et al., 1998). Warm, supportive relationships with good parent-child communication have been shown to reduce the risk of adolescent involvement in rule-violating behavior (Garnier & Stein, 1998; Hartos & Power, 1997; Igra & Irwin, 1996; Wagner, Cohen, & Brook, 1996). Although research on the impact of fathers on rule-violating behavior is limited, it appears that the influence of maternal and paternal parenting factors may be independent (Amato, 1998). The impact of father involvement may be more important for boys than for girls, and may differ according to socioeconomic and cultural factors (Marsiglio & Cohan, 2000; McLoyd, 1990). In general, adolescents perceive their fathers as cold and harsh in comparison to their mothers, suggesting that mothers may provide more of a positive coping resource during times of stress (Wagner et al., 1996).

Parental monitoring appears to be a protective resource against problem behavior (Bogenschneider, Wu, Raffaelli, & Tsay, 1998; Flisher et al., 2000; Igra & Irwin, 1996; Pettit, Bates, Dodge, & Meece, 1999), particularly among boys (Griffin et al., 2000). When a family monitors a child’s actions and sanctions deviant behavior, the child has less opportunity to participate in rule-violating behavior. Parental involvement and control of a child’s behavior is also thought to protect against problem behavior through the development of strong parental attachment and self-control in early childhood. Gottfredson and Hirschi (1994) write: “In some environments, the child learns to care about the wishes of parents and the school, and develops a commitment to the future and a strong set of values conducive to the denial of self-serving impulses costly to others. In
the absence of such early training by the family and the school, the individual will be relatively low on self-control, and will as a consequence be unusually vulnerable to the pleasures of the moment” (p.44). Kerr and Stattin (2000), however, argue that parental surveillance may be linked to increases in adolescent depression and rebelliousness, as it creates a sense of being controlled. They suggest that the observed link between parental knowledge of a child’s actions and decreased problem behavior may in fact be due to the child’s willingness to share information with the parent.

Parenting practices have a significant impact on the development of rule-violating behavior (Patterson et al., 1998). Social learning theory outlines a model in which coercive parent-child interactions result in negative reinforcement of aggressive behavior. Poor parenting skills (e.g., inconsistent or harsh discipline, poor problem solving skills, inadequate monitoring) and lack of positive involvement with the child contribute to the development of a repertoire of aggressive, coercive behaviors, which then leads to a variety of problematic behavior in other settings. Negative interactions with peers lead to social rejection, and the child begins to associate with other deviant and rejected children, who reinforce the patterns of antisocial behavior (Andrews & Dishion, 1994; Capaldi & Stoolmiller, 1999). The presence of early aversive parent-child exchanges predicts later antisocial behavior and delinquency, independent of behavior in other contexts (Andrews & Dishion, 1994). Effective parenting during early childhood, with consistent discipline, warmth and involvement, may reduce rule-violating behavior in adolescence. Prevention programs focused on family interventions have shown that improvements in effective communication, parental monitoring and supervision, and positive family interactions can reduce adolescent problems (Kumpfer & Alvarado, 2003).
Environmental Factors

Environmental factors can impact an adolescent’s decision to engage in rule-violating behaviors. Risk taking may be an attempt to relieve stress caused by a series of negative life events. Lyng (1993) defines risk-taking as “edgework,” a category that includes such benign activities as rock climbing and fire-fighting, as well as criminal behavior like bank robbery. He states that all edgework involves negotiating a boundary between life and death. It involves an attempt to push the limits of one’s ability to balance between order and disorder. In this way rule violation may be an attempt to test one’s limits and gain a feeling of control over the environment (Lyng, 1993). As a coping mechanism, active risk taking may reflect adaptation and resourcefulness (Anderson et al., 1993).

The influence of peers is also an important factor in an adolescent’s participation in rule-violating behavior. Peer influence is often associated with substance use and sexual behavior, and association with delinquent friends is a strong predictor of involvement in delinquency (Elliott & Menard, 1996; Igra & Irwin, 1996). This influence can be explained in two ways. Adolescents may participate in deviant behavior in response to “peer pressure” to conform to the group norms. Alternatively, adolescents with pre-existing tendencies to engage in rule-violating behavior might gravitate toward those with similar interests, perhaps after being rejected by more conventional peers (Andrews & Dishion, 1994). While the contribution of peer relationships to rule-violating behavior is significant, this factor will not be addressed in the current study.
Stressful life events. Involvement in rule-violating behavior is associated with exposure to stressors. Stressful life events are associated with higher initial levels of behavior problems, and are also associated with increases in behavior problems over time (Mathijssen, Koot, & Verhulst, 1999). Environmental stressors may include low school achievement, physical health problems, and even puberty itself (Dryfoos, 1993; Flisher et al., 2000). Childhood neglect and physical or sexual abuse are also linked with increased rule-violating behavior (Steiner & Cauffman, 1998; Widom, 1994). Parental divorce has been associated with greater rates of substance use, early sexual behavior, and adolescent pregnancy (Wolchik, Wilcox, Tein, & Sandler, 2000). Frequent change in family structure is also associated with more adolescent rule-violating behavior (Patterson et al., 1998). Parental death is arguably the most significant negative event that a child can experience (Coddington, 1972; Yamamoto et al., 1996). While it has been established that parentally bereaved children are at a high risk for internalizing symptoms, such as depression, anxiety, and social withdrawal, evidence is mixed regarding increases in behavior problems (Lutzke, Ayers, Sandler, & Barr, 1997; Sandler, Reynolds, Kliewer, & Ramirez, 1992; Van Eerdewegh, Clayton, & Van Eerdewegh, 1985; Worden & Silverman, 1996). Children and adolescents bereaved by parental suicide may be at increased risk for behavioral and emotional problems, in part due to increased disruption within the family prior to the suicide (Cerel, Fristad, Weller, & Weller, 1999; Cerel, Fristad, Weller, & Weller, 2000). It is likely that stressful life events have a cumulative effect, such that children who have experienced multiple stressors are at greater risk of developing problem behavior (Aguilar et al., 2000).
Individual characteristics may moderate the impact of stressors on behavior. Children with difficult temperament, low self-esteem, and external locus of control may be especially likely to develop behavior problems in response to negative life events (Kliewer & Sandler, 1992; Mathijssen et al., 1999). Verbal intelligence, social skills and instrumental competence may serve to protect adolescents exposed to stressors from involvement in rule-violating behavior (Flisher et al., 2000). The relationship between stressful events and unruly behavior may be stronger for boys, in that boys tend to respond to stress by acting out, while girls respond with more internalizing coping mechanisms (Wagner et al., 1996). The type of stressor may be important. Some evidence suggests that unruly behavior can be linked to conflict events, while separation events lead to symptoms of depression, but support for this idea is inconsistent (Sandler et al., 1992). The timing of an event may be important. Studies have shown that stressors during early adolescence (e.g., divorce, remarriage) have a strong influence on rule-violating behavior (Pagani, Tremblay, Vitaro, Kerr, & McDuff, 1998). Others suggest stressful events (e.g., loss of a parent) at an early age have more of a long-term impact on adjustment (Van Eerdewegh et al., 1985).

The effects of life stressors on children’s behavior may be moderated by the impact of the event on their parents. Both the number and severity of negative life events are important. Major life stressors like bereavement, divorce, and remarriage can result in diminished parenting ability as the parent adjusts to a new identity and lifestyle. The accumulation of everyday stressors such as financial difficulties and marital conflict may have an even stronger impact, as they increase psychological distress and affect the parent’s ability to supervise and support his/her children. Parental psychopathology and
ineffective coping strategies are also associated with increased distress and inconsistency of discipline. Active coping strategies, positive parenting techniques, high levels of warmth and acceptance, consistent discipline, family cohesiveness, and more stable positive family events may protect a child from developing behavior problems in response to life stressors (Lengua, Wolchik, Sandler, & West, 2000; Lutzke et al., 1997; Masten et al., 1999; Pagani et al., 1998; Silverman & Worden, 1992; Tein, Sandler, & Zautra, 2000; Wolchik et al., 2000). Thus, while multiple life events can increase involvement in rule-violating behavior, the impact on an individual child or adolescent may be moderated by the ability of his/her parent to cope with the stressors.

Socioeconomic status. Lower socioeconomic status places children and adolescents at risk for greater involvement in a variety of risk behaviors (Dryfoos, 1993; Flisher et al., 2000; Patterson et al., 1998). Rates of teenage parenthood, substance use, and truancy are higher in impoverished neighborhoods (Graber et al., 1998; Stouthamer-Loeber & Wei, 1998; Woodward & Fergusson, 1999). The association between SES and rule-violating behavior may be linked to a greater number of negative life events, greater impact of those events, or a lack of protective resources. Low-income families often are headed by younger or single parents, who may lack experience or be poorly educated. Economic difficulties and poor living conditions may increase the amount of conflict and tension within the household. The impact of negative life events (e.g., job loss) is greater within the context of lower socioeconomic status. Parents who lack extended social support and adequate coping resources will experience greater levels of distress and psychopathology. Additionally, lower socioeconomic status is associated with inadequate parenting skills and harsh discipline practices (McLoyd, 1990; Tolan, Guerra,
& Montaini-Klovdahl, 1997). In the absence of support from extended family networks, adolescents in poor neighborhoods may experience fewer societal sanctions against norm-violating behavior. They may have limited access to socially acceptable, highly stimulating activities (e.g., downhill skiing, whitewater rafting) as a way to express sensation seeking tendencies, and be more likely to take advantage of available opportunities to participate in rule violating behavior (e.g., drug use, delinquency) (Farley, 1981; Gottfredson & Hirschi, 1994; Jessor, 1992; Pfefferbaum & Wood, 1994).

**Summary and Purpose of this Study**

Rule-violating behavior (i.e., behavior that conflicts with social norms and behavioral expectations established by adult society) increases dramatically during adolescence. To a large extent, rule violations are a normative component of development. However, some adolescents engage in risky behaviors at earlier ages and to a greater extent than others. Early involvement in one type of rule-violating behavior is associated with increasing involvement in a variety of activities. This suggests that different types of risk behaviors may share common purposes, etiology, precipitating factors, and outcomes. Despite the similarities, individual behaviors also have unique characteristics that may not be encompassed by a general problem behavior factor. Given the potential consequences and costs for both the individual and society, it is important to understand the factors that predict adolescent rule-violations in general, as well as those specific to unruly behavior, substance use, and sexual activity.

Risk factors that have been identified include a variety of characteristics within the individual, family, and environmental spheres. Participation in rule-violating
behaviors has been shown to vary by gender, age, and pubertal status. Personality characteristics (e.g., high sensation seeking, impulsivity) and psychopathology such as symptoms of mood disorders and conduct disorder may predispose individuals toward risk taking. Family factors remain important influences on adolescent behavior, with poor family functioning, single parenthood, parental psychopathology, and use of ineffective parenting techniques all associated with increased problem behavior. Exposure to stressful life events and lower SES may also predict greater risk taking.

Due to the significant impact of delinquency and risk behavior on adolescent health and society as a whole, a great deal of recent research has been devoted to investigating the factors that predict and contribute to adolescent problem behavior. Overall, however, the field has often examined the effect of these variables in isolation. Many studies are cross-sectional or feature brief follow-up periods, and most focus on the impact of one or two independent variables on a few target behaviors. While this research offers a valuable contribution to our understanding of adolescent risk-taking, these studies often provide only a snapshot of the influences on rule-violating behavior. The current study will expand on current knowledge by examining a greater number of variables, from several domains (individual, family, environmental). This will allow simultaneous investigation of the impact of multiple variables on the level and change over time of involvement in risk behaviors, as well as providing insight into the nature of relationships between the different types of variables (e.g., moderation, mediation, suppression). The multivariate nature of the analyses will allow evaluation of the common determinants of the different types of rule-violating behavior, as well as the relative importance of unique influences, thus providing a test of the main assumptions of
problem behavior theory. The current study is longitudinal, with repeated assessments over a five-year time span, and includes both children and adolescents, thus providing an excellent opportunity to observe the pattern of change of behavior over time. Rather than focusing on at-risk youth, the current study will examine involvement in rule-violating behavior among a diverse group of children and adolescents with varying levels of risk and protective factors. New statistical techniques will allow the modeling of multiple variables nested hierarchically, and the examination of partially incomplete data that would have been excluded by traditional analytic methods.

This study will examine the influence of individual, family and environmental factors in predicting participation in rule-violating behavior among a large sample from a longitudinal study of bereaved, depressed, and community control children and adolescents. Four specific types of rule-violating behavior will be examined: unruly behavior, alcohol use, drug use, and sexual activity. The influence of demographic variables such as sex, age, and pubertal status will be assessed to determine differences in the level or course of participation in rule-violating behavior. Other variables will be examined systematically to determine whether they provide additional explanation of rule-violating behavior, beyond that which is accounted for by previously included variables and demographic characteristics. At each step, interactions with demographic characteristics such as age and sex will be examined to determine whether the effect is the same for all study participants.

Individual factors such as personality traits and existing psychopathology are likely to explain much of the variance in rule-violating behaviors. Also, if age or sex differences exist, these may be mediated by differences in rates of sensation seeking,
impulsivity, depressive symptoms and conduct disorder symptoms. Therefore, these factors will be entered first into the equation. Based on previous research, the predictive utility of depressive symptoms may be mediated by the presence of comorbid conduct disorder symptoms, so the interaction between these variables will be examined, as well as interactions with age and sex.

Because child and adolescent development and behavior are shaped significantly by the family environment, the addition of family variables will likely explain additional variation in rule-violating behavior, and may interact with the impact of individual factors. A child or adolescent who is at high-risk based on individual characteristics may not engage in rule-violating behaviors within the context of protective family factors, whereas a child with no individual risk factors may act out in reaction to ineffective parenting or disruptive family environment. Family variables expected to be important include parental psychopathology, family environment, and family structure (i.e., marital status at study entry). These variables, which assess both objective and subjective aspects of the family context, will be entered next into the model, and interactions with age and sex will also be tested.

The impact of family and individual characteristics occurs within the wider context of environmental stressors. Rule-violating behavior may increase in response to psychosocial stressors, regardless of the individual and family factors present. However, family factors may moderate the impact of negative life events such that individuals within well-functioning families may better withstand stressors than those with fewer protective factors. Environmental characteristics such as the number of negative life events, psychosocial stressors, life changes and socioeconomic status will be examined
next in the model. In order to test for moderating relationships, the interactions between family variables and environmental characteristics will be examined, as well as interactions with age and sex.

The following hypotheses are proposed:

**Hypothesis 1**: Individual factors will predict involvement in rule-violating behavior.

**Hypothesis 1a**: Consistent with previously observed increases in rule-violating behavior during adolescence, involvement in substance use, sexual activity, and unruly behavior will be significantly related to age and pubertal status. Younger, pre-pubertal children will engage in these behaviors at much lower rates than older, post-pubertal adolescents.

**Hypothesis 1b**: Males will participate in more rule-violating behavior than females. The patterns of behavior will differ significantly, and different factors will predict involvement in substance use, sexual activity, and unruly behavior.

**Hypothesis 1c**: Individual personality characteristics such as high levels of sensation seeking and a history of childhood impulsivity will be associated with greater involvement in rule-violating behavior.

**Hypothesis 1d**: Individual psychopathology will be associated with rule-violating behavior. Children and adolescents with more symptoms of depression and conduct disorder will engage in more substance use, unruly behavior, and early sexual activity. Early onset of symptoms will predict increased rates of rule-violating behavior. The relationship between symptoms of mood disorders and rule-violating behavior will be mediated by the presence of conduct disorder symptoms, such that those with comorbid symptoms will engage in more rule violation than those with depression alone.
Hypothesis 2: Family factors will predict involvement in rule-violating behavior beyond that accounted for by individual factors.

Hypothesis 2a: Parental marital status will predict rule-violating behavior. Adolescents whose parents were married at the time of study entry (or at time of bereavement) will engage in less rule-violating behavior than adolescents whose parents were separated, divorced, or never married.

Hypothesis 2b: Parental psychopathology will be associated with more adolescent involvement in substance use, unruly behavior, and sexual behavior.

Hypothesis 2c: A supportive family environment (e.g., more family activities, consistent discipline, less marital discord) will be associated with less involvement in rule-violating behavior. Family environment will moderate the effect of negative life events on behavior.

Hypothesis 3: Environmental factors will predict involvement in rule-violating behavior, beyond that accounted for by individual and family factors.

Hypothesis 3a: Children and adolescents who experience more psychosocial stressors and significant life events (e.g., bereavement, divorce, financial problems, and abuse/neglect) will engage in more substance use, unruly behavior, and early sexual activity.

Hypothesis 3b: Lower socioeconomic status will predict involvement in more substance use, unruly behavior, and early sexual activity.
CHAPTER 2

METHOD

Participants

The data utilized in this study were collected as part of the Grief Research Study, a longitudinal evaluation of childhood bereavement, supported by NIMH grants 1 RO1 MH44135 and 1 RO1 MH45534. Participants included 368 children bereaved from parental death, 111 children diagnosed with a depressive disorder, and 129 control children from the community. Participants ranged in age from 5-17 [M(SD) = 11.4(3.2)] at time of initial assessment, and 52% were male. Despite special efforts to recruit eligible families from racial minority groups, 98% of participant families were Caucasian.

Bereaved families were recruited based on regular reviews of obituaries from local newspapers and contact with local funeral homes. Families were contacted by telephone, and approximately one-third of the eligible families agreed to participate. Initial interviews were conducted approximately one month after the parent’s death. All bereaved children had experienced the death of only one parent. No child had experienced sibling death. During the two years preceding the death, all children had regular contact with their deceased parent (i.e., standard custody and visitation
agreements were in place for divorced parents). Families of depressed participants were recruited following review of inpatient and outpatient charts in the Division of Child and Adolescent Psychiatry, The Ohio State University. Children with a diagnosis of Major Depressive Disorder, Dysthymia or Bipolar Disorder, Depressed Episode were eligible for the study. Families for the community control group were recruited through contact with local church groups and schools. Parents were contacted by telephone and asked to participate. No depressed or control group participant had ever experienced the death of an immediate family member and none had experienced the death of a close relative in the two years prior to study entry. No community control child or participating family member had received mental health treatment in the two years prior to study entry.

Procedure

Separate interviews with the children and their participating parents were conducted simultaneously by different interviewers in the family’s home or in study offices. All participants gave informed assent/consent prior to the interview. The initial interview, which lasted two to four hours, assessed current functioning as well as functioning over the child’s lifetime. Follow-up interviews were administered 6, 13, 25, and 60 months after the initial evaluation. These interviews were one to three hours long and assessed current functioning as well as symptoms and events that had occurred since the previous interview. The initial interview and first three follow-up interviews occurred during the first phase of the project, designed to assess the acute impact of bereavement during the first two years post death, including the impact of the one-year and two-year anniversary dates. Phase two of the project was designed to evaluate the intermediate course of grief reactions, up to five-years after bereavement. Interviewers
were highly trained staff, graduate students and undergraduates with inter-rater reliability ratings of greater than 0.80. Community control children were paid $10 at the 1, 6, and 13 month interviews and $20 at the 25 month interview. All participants were paid $40 at the 60 month interview.

Measures

Rule-violating behavior. The Diagnostic Interview for Children and Adolescents-Revised (DICA-R) is a structured interview designed to assess symptoms of psychopathology (using DSM-III-R criteria) and psychosocial stressors in children. It shows good reliability and validity in comparison to psychiatric diagnoses and parent-child agreement (Reich & Welner, 1988). Separate versions for parents, children/adolescents, and young adults were used. Scales were created by calculating the mean of individual items assessing participation in minor unruly behavior (e.g., telling lies, skipping school, swearing, shoplifting), use of alcohol (e.g., getting drunk, binge drinking), use of other substances (e.g., cigarettes, marijuana), and sexual behavior (e.g., being sexually active, having/causeing pregnancy, age <15 at first intercourse, number of partners) and multiplying by 100. Questions about participation in rule-violating behavior during eight separate time periods were asked at each interview. Analyses focused on behavior reported to occur before the first interview and at any time since the previous assessment at the 6, 13, 25, and 60 month interviews.

Sensation seeking. The Zuckerman Sensation Seeking Scale: Form II (SSS) (Zuckerman, Kolin, Price, & Zoob, 1964) is a 34-item forced-choice questionnaire. It assesses an individual’s general sensation seeking tendencies, based on items measuring an individual’s preference for novelty, excitement, adventure, and intense physical
sensations (temperature, sound, taste), and dislike for predictability and routines. These items have been shown to form a single factor, although factor loadings differ for males and females. Satisfactory levels of reliability and construct validity have been demonstrated (Zuckerman et al., 1964). Later versions (Forms IV and V) measure total sensation seeking, as well as four scales: thrill and adventure seeking, experience seeking, disinhibition, and boredom susceptibility (Zuckerman, 1994). These later versions have reported reliability levels of 0.83-0.86 for the total score and 0.56-0.82 for the subscales (Zuckerman, Eysenck, & Eysenck, 1978). They have been criticized for their use of a forced choice format and the inclusion of potentially confounded items referring to strenuous physical activities, substance use and sexual behavior (Arnett, 1994). The version used in the current study (Form II) contains one item referring to drug use (i.e., “I would not like to try any drug which might produce strange and dangerous effects on me” vs. “I would like to try some of the new drugs that produce hallucinations”). This item was eliminated from the scale during analysis to avoid inflating the relationship between sensation seeking and rule-violating behavior.

Impulsivity. The Attention Deficit-Hyperactivity Disorder section of the DICA-R assesses symptoms of inattention, hyperactivity, and impulsivity (using DSM-III-R criteria) in children (Reich & Welner, 1988). A scale was created by taking the mean of all items assessing impulsivity and multiplying by 100. Separate versions of this structured interview were used for parents, children/adolescents, and young adults. Questions about these symptoms were asked at each interview. Analysis focused on behavior reported to occur before the first interview and at any time since the previous assessment at the 6, 13, 25, and 60 month interviews.
Child psychopathology. The DICA-R assesses symptoms of psychopathology (using DSM-III-R criteria) in children (Reich & Welner, 1988). Separate versions for parents, children/adolescents, and young adults were used. Scales were created by calculating the mean of items endorsed in the mood disorders (e.g., feeling sad, feeling irritable, change in appetite, loss of interest) and conduct disorder (e.g., fighting, school suspensions, and vandalism) sections of the DICA-R and multiplying by 100. These questions were asked at each interview. Analysis focused on symptoms reported to occur prior to the first interview and at any time since the previous assessment at the 6, 13, 25, and 60 month interviews.

Family structure. Demographic information obtained during the initial interview was used to determine the parent’s marital status at time of study entry. For families in the bereaved group, marital status immediately prior to the parent’s death was used. Additionally, information about the primary parent’s age and sex was also obtained.

Parental psychopathology. The Hamilton Rating Scale for Depression (HRSD) is a severity rating scale used to assess depressive symptomatology in adults (Hamilton, 1967). A review by Hedlund and Vieweg (1979) indicates high inter-rater reliability and adequate validity. This 17-item scale was administered at each interview to the primary parent to assess the severity of his or her own depressive symptoms during the two weeks prior to the interview.

The Psychiatric Diagnostic Interview (PDI) is a structured diagnostic interview used to assess 13 psychiatric diagnoses in adults (Othmer, Penick, Powell, Read, & Othmer, 1989). Psychometric studies revealed high inter-rater, intra-rater, and test-retest
reliability, and adequate discrimination between groups (Othmer et al., 1989). In this study, a portion of the PDI was used to determine the presence of 5 psychiatric diagnoses in the informant parents at each of the five assessments.

*Family functioning.* The *Home Environment Interview- Abbreviated Version- Child and Parent Forms* is a semi-structured interview assessing the quality and quantity of familial and non-familial interaction (Reich & Earls, 1984; Robbins, 1983). Inter-rater reliability was greater than 0.80. Information from this interview was used to create scales measuring the following aspects of family functioning: (1) *Family Activities.* Both child and parent versions of the interview include questions about the types of activities in which the child and his/her parent(s) participate (e.g., going places together; activities at home; doing schoolwork or household chores together) and whether they feel they “do a lot” together. Scales were created by calculating the mean of items endorsed by the child and by the parent. This information was obtained each interview. (2) *Family Functioning.* During the initial interview, the child version included questions about the child’s opinion of positive and negative aspects of their parent’s behavior (e.g., being affectionate, being easy to talk to, frequently criticizing or placing too much pressure on the child). Two subscales were created by calculating the mean of negative items and the mean of positive items endorsed. Items on these subscales were included only in the initial interview. (3) *Marital discord.* During the initial interview, the child version included questions about the child’s perception of the quality of their parents’ relationship (e.g., enjoyment of being together, shared decision making, quarreling). Two subscales were created by calculating the mean of negative items and the mean of positive items endorsed. Items on these subscales were included only in the initial
interview. (4) Supervision and discipline. During the initial interview, the child version included questions about the child’s perception of their parents’ rule making and discipline practices (e.g., the types of rules set by the parent, the consistency of enforcement, and typical methods of punishment). Two subscales were created by calculating the mean of negative items and the mean of positive items endorsed. Items on these subscales were included only in the initial interview.

Life events. The DICA-R assesses psychosocial stressors in children (Reich & Welner, 1988). Separate versions for parents, children/adolescents, and young adults were used. A scale was created by calculating the mean of items endorsed (e.g., child abuse, financial problems, death of a close relative or friend, serious illness in the family) in the psychosocial stressors section of the DICA-R and multiplying by 100. These questions were asked at each interview. Analysis focused on events reported to occur prior to the first interview and at any time since the previous assessment at the 6, 13, 25, and 60 month interviews.

The Coddington Life Events Scale asks the parent to report which of 36 stressors have occurred in the child/adolescent's life, which are then weighted to derive an estimate of the total amount of stress the child has experienced. Test-retest reliability and parent-child agreement have been demonstrated to be adequate (Coddington, 1983). This instrument was used at each of the follow-up interviews to obtain information about the types of stressful events the child or adolescent had experienced since the last interview.

The Home Environment Interview- Abbreviated Version- Child and Parent Forms (Reich & Earls, 1984; Robbins, 1983). Both child/adolescent and parent versions include questions pertaining to changes within the family (e.g., change in household membership,
marital status, economic status, religious practices). This information was obtained at each of the follow-up interviews, and referred to changes since the last interview. Scales were created by calculating the mean of items endorsed by the parent and by the child/adolescent, and multiplying by 100.

**Socioeconomic status.** The Hollingshead Two-Factor Index of Social Position (Hollingshead & Redlich, 1958) was used to determine socioeconomic status based on parental occupation and education level. This information was obtained at each interview.

**Data Analysis**

**Preliminary scale development.** A number of scales were created for this study using items from the DICA-R and the Home Environment Interview (see Appendix B for item content of scales). These scales, measuring rule-violating behaviors, individual characteristics, psychopathology, and family functioning, were initially created using items that contained moderate to high levels of face validity. To minimize the impact of missing data on scale scores, the mean of the items was calculated, rather than the sum of item responses. The scale score was then multiplied by a constant of 100 for mathematical convenience in interpreting values. In order to conduct further levels of scale development, a sample of 100 participants was randomly selected from the study participants. This smaller exploratory sample was used to test the reliability of the preliminary scales and revise their content. In order to examine the structure and reliability of the scales across time, an attempt was made to conduct a confirmatory factor analysis, constraining the parameters to equality over time. First LISREL and then Mx,
two computer statistical analysis programs known for the ability to handle missing data, were used to set up the analyses. These efforts were unsuccessful, presumably due to the amount of missing data. Therefore, reliability of the scales was measured independently at each time period using SPSS 10.1. Additionally, rather than conducting separate single-factor factor analyses for each scale, reliability at each time period was measured using the "Kuder-Richardson 20" formula for scales with dichotomous items, which is interpreted in the same manner as coefficient alpha in continuous variables. Item-total correlations were used to guide the deletion of specific items, in order to maximize scale reliability. See Table 1 for final scale reliability data within the exploratory sample.

Following completion of scale development, the remainder of the study sample was used to confirm scale reliability and to test the proposed hypotheses using these scales. See Table 2 for reliability data for all scales at each time period in the confirmatory sample.

A significant drawback of the method used to measure internal consistency is that only individuals who answer all items on a particular scale will be included in the analysis. Given the frequency of missing data in this study, the reliability analyses were often based on data from a minority of the study participants. Therefore, because of limited sample size, the reliability coefficients may underestimate the actual internal consistency of the scales. Despite these limitations, it was decided to continue to include these measures in the remaining analyses. Unreliable measures have less power, and it is less likely that results will achieve statistical significance. Therefore, if measures with low estimates of reliability are found to have significant results, it is more likely to be a true effect.
Hypothesis Testing. Study hypotheses were tested using a series of multivariate multilevel modeling procedures. Multilevel models are used to study the structure of hierarchically organized data, and to clarify the relationships among variables within and between levels (MacCallum, Kim, Malarkey, & Kiecolt-Glaser, 1997). The current longitudinal data were organized hierarchically by nesting occasions of measurement within subjects. This method allows the observation of intra-individual variation (change over time) and inter-individual variation (variation among individuals in the pattern of change over time) of a dependent variable. Multilevel modeling examines the amount of variance in the dependent variable accounted for by multiple predictors. At the same time, it also provides information about the amount of variance in the patterns of change over time explained by the predictor variables. In addition, multilevel modeling allows the partitioning of the amount of variance due to intra-individual variation from the error variance. Both linear and nonlinear equations may be used to measure change over time on the outcome variable.

When multilevel modeling techniques are extended to involve multiple response variables, the covariation between the dependent variables across individuals is calculated, allowing the examination of the relationships between patterns of change on different variables. Specification of multivariate multilevel models requires the use of dummy variables to weight each outcome variable in the model. This allows a model to be tested simultaneously on more than one dependent variable, reducing the number of total comparisons made. The statistical software used for the current analyses contained options for specifying the dummy variables, and models were created to include both parent and child reports of each separate rule-violating behavior.
Multilevel modeling allows flexibility in the timing and number of assessments. Participants may be assessed at different times, and missing data are easily accommodated. Dependent variables may also be measured on different occasions, or at different numbers of time points. Missing data are assumed to be random in nature, and not the result of some systematic difference in the individual participants. It is suggested that at least 4-5 time points be included, and that sample sizes should be large relative to the number of variables and occasions of measurement (MacCallum et al., 1997). This was particularly advantageous in the current longitudinal study, as many of the participants either did not provide data at one of the assessments or failed to answer some items within an interview.

Multivariate multilevel modeling was chosen over multiple regression and latent growth curve modeling analyses for several reasons. Multi-level modeling provides the ability to accommodate both linear and nonlinear models, as well as the ability to allow the effects of some predictor variables to vary between subjects, while constraining the effects of other variables to be equal for all individuals. Unlike multiple regression, multilevel modeling separates intra-individual variation over time from error variance. It allows for the examination of the impact of predictor variables on both the level of the dependent variable as well as on its change over time. Multilevel modeling is less vulnerable than multiple regression analysis to the effects of multicollinearity and skewed distributions. Multilevel models are similar to latent growth curve analyses in many ways (MacCallum et al., 1997). They both allow the observation of the relationship of correlates and predictor variables to the slopes and intercepts of multiple outcome variables. Both can be used to observe nonlinear patterns of change over time. Often,
these methods produce identical models of change. Latent growth curve models, however, utilize latent factors extracted from a covariance matrix, and the relationships are illustrated using path diagrams. Another distinction is that latent curve modeling emphasizes assessing the overall fit of the model, while multilevel modeling emphasizes evaluating parameter estimates and comparing nested models. A particularly strong benefit of multilevel modeling, however, is the ability to compensate for missing data. Most statistical software used to create latent growth curve models requires data to be collected from all individuals at the same time, with data from all participants available for each assessment. Given the amount of missing data points in the current study, as well as the fact that data was collected from participants on an individual basis at different times, and with some variation in the intervals between repeated assessments, multilevel modeling was the preferred method for the current data analyses.

Four separate multivariate multi-level models were created, testing the ability of multiple independent variables to predict alcohol use, drug use, unruly behavior, and sexual activity. The data were analyzed using and MLwiN 1.10. In order to reduce error introduced by multiple comparisons, each model tested the effects of variables on both parent-reported and child-reported behavior at each of the five assessments. Independent variables were entered into the model equation hierarchically. At each step, multiple variables were added to the equation, and variables that contributed to the fit of the model were retained. First, variables representing time were entered to determine the amount of variance accounted for by linear and nonlinear change over time. Next, demographic variables (sex, age, pubertal status, race, SES) were entered, followed by individual psychopathology/personality variables (conduct disorder symptoms, depressive
symptoms, impulsivity, and sensation-seeking). Next, family structure variables were entered into the model (parent marital status, parent sex, and parent age). Variables measuring parental psychopathology (level of depression, number of psychiatric diagnoses) were then entered, and family functioning variables (family activities, family functioning, marital functioning, and rules/discipline) were added next. Finally, variables measuring environmental characteristics (psychosocial stressors, life events, changes) were tested. Relevant interactions were entered into the model at each step immediately following the inclusion of the main effects (age and sex interactions for all variables, conduct disorder x depression, family functioning variables x environmental stressors).

The difference in likelihood statistic (-2*log-likelihood) caused by the addition of predictor variables was used to compare the fit of the models to the data. The change in the likelihood statistic can be regarded as a chi square ($X^2$) statistic with degrees of freedom equal to the number of additional parameters, and with a null hypothesis that the extra parameters are equal to zero. To reduce the impact of multiple comparisons on Type I error, a stringent alpha level was selected (alpha = .0001). To aid interpretation, significant interactions were inspected visually by plotting values produced by entering high, low, and mean scores on the predictor variables into the prediction equation.
CHAPTER 3

RESULTS

Descriptive analyses

Descriptive analyses were conducted to measure the frequency of occurrence of rule-violating behaviors within the combined sample of children and adolescents. For all the dependent variables, the frequency of reported behavior was quite low (less than 20% of items answered were endorsed positively), and the standard deviations were quite large, suggesting a great deal of variability in responses. Additionally, visual inspection of the means for each assessment period suggests a nonlinear increase over time in rule-violating behavior. See Tables 3-6 for demographics and the means and standard deviations of scores on child and parent-reported Sexual Activity, Alcohol Use, Drug Use, and Unruly Behavior at each time period. Paired samples \( t \) tests were used to determine whether significant differences (alpha = .01) existed between parent and child reports of the four dependent variables. See Table 7 for the results of \( t \) tests. For all variables except Unruly Behavior, child reports of rule-violating behavior appeared greater than parent reports. Statistically significant differences were found for reports of sexual activity at the first, third, fourth, and fifth interviews, but no difference existed at the second interview. For alcohol use, significant differences existed at time one, two,
and four, but not at time three or five. Differences were significant for reported drug use at the first, second, fourth, and fifth interviews, but non-significant at the third interview. Parents reported significantly more unruly behavior than their children at time one, two, three, and four, but no difference was found at the last assessment.

Child reported and parent reported scores on each scale of rule-violating behavior were strongly correlated at each time period, ranging from .40 to .54 for Sexual Activity, .40 to .48 for Alcohol Use, .54 to .73 for Drug Use, and .38 to .47 for Unruly Behavior. Relationships between different types of rule-violating behavior were also strong. Alcohol and drug use were most strongly correlated over all time periods (.34 to .65, median = .51). Correlations between sexual behavior and alcohol use (.17 to .58, median = .32) and sexual behavior and drug use (.08 to .43, median = .31) were moderate in strength. Weak to moderate correlations were found between unruly behavior and alcohol use (.04 to .42, median = .21) and unruly behavior and drug use (.05 to .35, median = .28). Sexual behavior and unruly behavior were most weakly related (.04 to .29, median = .17). Most values were significant (p<.01). See Tables 8-12 for correlation matrices. Spearman’s rho was used to compensate for skewed distributions of the variables, and to provide a more conservative estimate of the correlations.

**Multilevel Modeling**

**Unruly behavior.** The first step, calculating a baseline variance components model, examined the partitioning of the total variance into variance between individuals and variance across time within individuals. For both child-reported and parent-reported
unruly behavior, both the within-subject variance \([M(SE) = 143.86(5.4), 125.97(4.7)]\) and
the between-subject variance \([(158.14(12.7), 243.24(17.7)]\) were significant. The
likelihood statistic \((-2* \log \text{ likelihood})\) for the baseline model was 31322.43.

Next, the impact of adding variables representing time to the model was assessed.

First, a variable was added to determine the linear impact of time on unruly behavior,
with the assumption that the slopes of each individual’s scores across time were equal.
This resulted in a significant improvement of model fit \((X^2(2df) = 29.79, p<.00001)\).

Next, the impact of time was allowed to vary between individuals (i.e., the lines
representing each individual’s scores across time were allowed to differ from the average
in both intercept and slope). This random intercept and slope model resulted in a
significantly better fit to the data. \((X^2(7)=162.94, p<.00001)\). The addition of a variable
to measure the nonlinear effect of time on unruly behavior \((\text{time}^2)\) did not result in a
significant increase of model fit \((X^2(2)=12.97, p=.0015)\). Thus, a linear model
adequately describes the change of unruly behavior over time. The variance and
covariance of the random intercepts and slopes are all statistically significant (the
variance is at least twice the magnitude of its estimated standard error). This indicates
significant unexplained variance between individuals in the intercepts of both child-
reported \([171.06(13.5)]\) and parent-reported \([242.43(18.1)]\) unruly behavior as well as in
their rates of change over time \([6.82(0.9), 2.12(0.6)]\). In addition, the covariances
between both the slopes \([1.55(0.55)]\) and the intercepts \([154.59(13.27)]\) of parent-
reported and child-reported unruly behavior are significant, suggesting that parent and
color reports of the level and rate of change of unruly behavior are strongly correlated.
Next, variables were entered into the model in the pre-specified order. Variables that resulted in an increase of model fit were retained in the model. Those that produced no significant change in model fit (as determined by measuring the decrease in model fit produced by eliminating that variable) were discarded. The results of the hierarchical analysis are shown in Table 13. The final model contains variables representing the following: time (linear), gender, age, pubertal status, SES, conduct disorder symptoms, depressive symptoms, impulsivity, sensation seeking, parent marital status at time 1, parent psychopathology, family activities, family functioning, marital functioning, and stressful life events. The following interaction terms were also included in the final model: age x parent-reported conduct disorder symptoms, age x impulsivity (parent report), and child-reported psychosocial stressors x family activities (child report). The likelihood statistic for the final model was 5729.41, a significant improvement over the baseline model ($\chi^2(53)=25593.02$, $p<.00001$). Each of the variables improved the fit of the model when they were included in hierarchical fashion. However, in the final model, not all variables remained significant predictors of individual differences in unruly behavior. As predictors of child-reported unruly behavior, sensation seeking [17.855(7.977)], positive aspects of family functioning [-0.202(0.049)], and significant life events [.0044(0.002)] were significantly different from zero. The interaction between age and conduct disorder symptoms (parent report) was significant [0.145(0.026)], as well as a significant main effect for conduct disorder symptoms [parent-report = -1.255(0.288)]. A significant interaction was also found between child-reported psychosocial stressors and family activities (child report) [-0.013(0.003)], as well as a significant main effect for psychosocial stressors [child report = 1.183(0.278)]. Parent-
reported depression [0.195(0.063)], positive aspects of parent’s marital relationship 
[-0.101(0.042)], and significant life events [0.010(0.002)] were significant predictors of 
parent-reported unruly behavior. Additionally, a significant interaction was found 
between impulsivity (parent report) and age [-0.028(0.012)], along with a main effect for 
impulsivity [0.454(0.123)]. The interaction between child-reported psychosocial 
stressors and family activities was significant [-0.013(0.004)], as well as the main effect 
for child-reported psychosocial stressors [1.189 (0.321)]. The interaction between age 
and parent-reported conduct disorder symptoms was significant [0.125(0.031)], although 
the main effects did not differ from zero. The variance/covariance matrix reveals 
significant reductions in the between subjects variance. Significant unexplained variance 
remains in the intercepts of both child-reported [52.29(8.59)] and parent-reported 
[46.13(8.99)] unruly behavior, and the slope of child-reported unruly behavior 
[3.86(1.65)], but unexplained variance in slope does not significantly differ from zero 
[0.63(1.66)] for parent-reported unruly behavior. Unexplained within-subjects variance 
is also greatly reduced [child report = 33.33(3.70), parent report = 60.75(6.30)], but 
remains significantly different from zero.

Results for child and parent reported unruly behavior partially supported the study 
hypotheses. Hypothesis 1 (Individual factors will predict involvement in rule-violating 
behavior) was partially supported. A strong relationship was revealed between individual 
psychopathology (1d) and unruly behavior. Greater depressive symptoms, as reported by 
the parent, significantly predicted more unruly behavior. Overall, greater parent-reported 
conduct disorder symptoms predicted decreased child-reported unruly behavior. Parent- 
reported symptoms of conduct disorder interacted with age such that older adolescents
with higher levels of conduct disordered behavior appear to have significantly more reported unruly behavior, while there seems to be no significant effect of conduct disorder symptoms at younger ages. Personality characteristics (1c) were also significantly related to unruly behavior. Impulsivity (parent report) significantly predicted more parent-reported unruly behavior. A significant interaction with age reveals that the effect is strongest at young ages, with parents of children with high levels of impulsivity reporting much higher levels of unruly behavior, while at older ages, there is no difference. Greater sensation seeking significantly predicted more child reported unruly behavior. Inclusion of age (1a) and pubertal status (1a) in the model created a significant increase in model fit, but these were not significant predictor variables in the final model. Sex differences (1b) did not contribute to the model fit, but was retained in the model in order to test for sex interactions. Hypothesis 2 (Family factors will predict involvement in rule-violating behavior) was also partially supported. Two aspects of a supportive family environment (2c) were significant predictors of unruly behavior, with positive family functioning predicting fewer child-reported unruly behavior and greater marital harmony predicting fewer parent-reported unruly behavior. Additionally, parent marital status at first assessment (2a), parental psychopathology (2b) child-reported family activities (2c) negative aspects of family functioning (2c), and marital discord (2c) contributed significantly to the fit of the model, although they did not remain significant predictors of unruly behavior. Inclusion of variables representing the primary parent’s sex and age (2a) did not significantly improve the model. Hypothesis 3 (Environmental factors will predict involvement in rule-violating behavior) received partial support. In general, greater child reported psychosocial stressors significantly predicted more unruly
behavior (parent and child report). Psychosocial stressors significantly interacted with child-reported family activities, such that for children with more reported stressors, higher levels of family activities seem to strongly predict fewer unruly behavior, while for those with lower levels of stress, greater involvement in family activities appears to predict slightly more reported unruly behavior. Parent reported psychosocial stressors, significant life events, and SES contributed to the model fit, but did not predict individual levels of unruly behavior, while variables measuring exposure to changes (3a) did not explain any additional variance in unruly behavior.

Alcohol Use. The baseline variance components model reveals significant within-subject variance \([M(\text{SE}) = 469.86(17.60), 429.12(15.73)]\) and between-subject variance \([215.09(22.22), 170.71(18.38)]\) for both child-reported and parent-reported alcohol use. The likelihood statistic \((-2\log \text{likelihood})\) for the baseline model was 35352.07. Next, variables representing time were added to the model. First, a variable was added to determine the linear impact of time on alcohol use, with the assumption that the slopes of each individual’s scores across time were equal. This resulted in a significant improvement of model fit \((X^2(2)=3326, p<.00001)\). Next, the impact of time was allowed to vary between individuals, resulting in a significant increase of model fit \((X^2(7)=555.2, p<.00001)\). The addition of a variable to measure the nonlinear effect of time on alcohol use \((\text{time}^2)\) resulted in a significantly better fit to the data \((X^2(13)=96.58, p<.00001)\). Thus, a random nonlinear model best describes the change of alcohol use over time. The variance and covariance of the random intercepts and slopes are all statistically significant. Significant unexplained variance between individuals exists in the intercepts of both child-reported \([372.26(35.24)]\) and parent-reported \([204.21(21.26)]\)
alcohol use as well as in their rates of change over time [2.11(0.56), 3.16(0.63)]. In addition, the covariance between both the intercepts [166.08(20.94)] and the slopes [1.35(0.44)] of parent-reported and child-reported alcohol use are significant, suggesting that parent and child reports of the level and rate of change of alcohol use are strongly correlated.

Next, the predictor variables were entered into the model as previously specified. Variables that significantly contributed to the model fit were retained in the model. The final model for alcohol use (see Table 14) contained variables representing the following: time (nonlinear), sex of child, age of child, pubertal status, race, child and parent reported conduct disorder symptoms, parent report of depression, sensation seeking, marital status, parent depression, family activities, marital functioning, rules and discipline, and child-reported psychosocial stressors. The following interaction terms were also included in the model: age x pubertal status, age x child-reported conduct disorder symptoms, age x depressive symptoms (child and parent report), child-reported conduct disorder symptoms x depressive symptoms, child-reported psychosocial stressors x marital conflict, and psychosocial stressors (child report) x negative types of rules and discipline. The likelihood statistic for the final model was 12790.33, a significant improvement over the baseline model (Χ²(72)=22561.74, p<.00001). Each of the variables improved the fit of the model when they were included in hierarchical fashion. However, in the final model, not all variables remained significant predictors of individual differences in alcohol use. As predictors of child-reported alcohol use, age of child [-4.056(1.247)], pubertal status [-40.290(7.157)], the interaction between age and pubertal status [3.385(0.658)], parent reported depression [0.444(0.231)], the interaction between age
and depression (parent report) [-0.044(0.018)], sensation seeking [17.282(7.900)], marital status [-11.366(4.581)], the interaction between age and marital status [1.304(0.412)], and child-reported family activities [-0.056(0.025)] were significantly different from zero. Conduct disorder symptoms (child report) [-0.419(0.180)], the interaction between age and child-reported conduct disorder symptoms [0.048(0.016)], parent-reported depression [-0.311(0.121)], the interaction between age and parent-reported depression [0.041(0.010)], sensation seeking [11.242(4.537)] use of negative rules and discipline [-0.051(0.026)], and the interaction between child-reported psychosocial stressors and marital conflict [0.0035(0.0014)] were the only significant predictors of parent-reported alcohol use. The variance / covariance matrix reveals significant change in the between-subjects variance. Significant unexplained variance remains in the intercepts of both child-reported [82.03(21.67)] and parent-reported [52.61(8.02)] alcohol use, and unexplained variance in change over time actually increased after adding the predictor variables [7.00(1.21), 14.71(1.61)]. Unexplained within-subjects variance is greatly reduced [child report = 108.53(9.38), parent report = 20.56(1.93)], although still significantly different from zero.

Results for child and parent reported alcohol use partially supported the study hypotheses. Hypothesis 1 (Individual factors will predict involvement in rule-violating behavior) received strong support. Both child age (1a), and pubertal status (1a) predicted child-reported alcohol use, and the interaction between age and puberty was significant. At younger ages, pre pubescent children appear to report higher levels of alcohol use than post-pubertal children, but this discrepancy decreases with age, and reports of drinking appear similar for the two groups around age 12. Among older adolescents, alcohol use
is greater among those who have reached puberty. Overall, significant main effects suggest that levels of alcohol use are highest among younger, pre-pubertal children, and decrease with age. Child psychopathology was a significant predictor of alcohol use, with parent reported depression (1d) predicting greater parent reported alcohol use overall. The interactions between age and parent reported depression differ for parent and child-report behavior. For parent-reported alcohol use, older adolescents with more symptoms of depression seem to drink significantly more than non-depressed adolescents, while no significant effect on drinking appears to exist for younger children. Regardless of depressive symptoms, child reports of alcohol use decrease with age. Older adolescents with more symptoms of depression seem to report less drinking than less-depressed peers, but among younger children, depression predicts increased drinking. Parents appeared to report higher levels of alcohol use for children who reported higher levels of conduct disorder symptoms. This effect seemed to be strongest among older adolescents, while there appeared to be no difference among younger children. Overall, greater levels of alcohol use are reported for those with fewer conduct disorder symptoms. Sensation seeking (1c) predicted both parent and child-reported alcohol use. Child sex (1b) and race contributed significantly to the fit of the model, but did not predict individual levels of alcohol use. Impulsivity (1c) did not significantly contribute to the model fit. Hypotheses 2 (Family factors will predict involvement in rule-violating behavior) and 3 (Environmental factors will predict involvement in rule-violating behavior) received limited support. The impact of parent marital status on alcohol use interacted significantly with the child’s age. Overall, children whose parents were married at the time of the initial interview seem to report less drinking than those
whose parents were separated, divorced, or never married at the first assessment. This effect seems to be strong among older adolescents, while appearing to have no effect among younger children. Child reported family activities significantly predicted child reported alcohol use. Variables measuring parental psychopathology (2b), marital functioning (2c), and use of consistent rules (2c) contributed significantly to the fit of the model, although they were not significant predictors of alcohol use. Child-reported psychosocial stressors significantly interacted with marital discord to predict parent-reported alcohol use. For children with high levels of reported stressors, alcohol use seems to increase significantly with greater levels of marital conflict, while children with fewer stressors appear to report less drinking as marital conflict increases. No significant main effects were observed for marital conflict or psychosocial stressors. Inclusion of variables representing the primary parent’s sex and age (2a), as well as measures of exposure to significant life events and changes (3a) did not improve the fit of the model.

**Drug Use.** The baseline variance components model for child-reported and parent-reported drug use reveals significant values for within-subject variance [103.95(4.18), 74.68(2.96)] and between-subject variance [101.40(8.63), 60.62(5.38)]. The likelihood statistic (-2*log likelihood) for the baseline model was 25217.87. Next, the impact of adding variables representing time to the model was assessed. Both fixed and random models of the linear and nonlinear impact of time on drug use were evaluated. A linear model with random intercepts and slopes resulted in the best fit to the data. (-2*log likelihood= 24285.11; $X^2(9)=932.76$, p<.00001). The variance and covariance matrix depicts statistically significant unexplained variance between individuals in the intercepts of both child-reported [128.73(9.57)] and parent-reported
drug use, as well as in their rates of change over time [8.41(0.83), 6.27(0.61)]. In addition, the covariance between both the intercepts [86.36(6.70)] and the slopes [5.68(0.62)] of parent-reported and child-reported drug use are significant, suggesting that parent-reported and child-reported level and rate of change of drug use are strongly correlated.

Next, the predictor variables were entered into the model as previously described, and variables that significantly contributed to an increase in model fit were retained in the model. The final model for drug use (Table 15) contains variables representing the following: time (linear), age of child, sex of child, puberty, SES, conduct disorder symptoms, depression, impulsivity, marital status at time 1, parental psychopathology, family activities, marital functioning, psychosocial stressors, and significant life events. The following interaction terms were also included: age x conduct disorder symptoms (parent report), age x depressive symptoms (child and parent report), age x impulsivity (child and parent report), sex x conduct disorder (parent report), depression (child report) x conduct disorder (child report), and parent reported psychosocial stressors x family activities (parent report). The likelihood statistic for the final model was 6654.01, a significant improvement over the baseline model ($\chi^2(63)=18563.86$, $p<.00001$). Each of the variables improved the fit of the model when they were included in hierarchical fashion. However, in the final model, not all variables remained significant predictors of individual differences in drug use. As predictors of child-reported drug use, age of child [0.671(0.243)], child-reported depression [-0.491(0.185)], the interaction between age and child-reported depression [0.042(0.013)], the interaction between child-reported depression and child-reported conduct disorder symptoms [0.013(0.004)], positive family
functioning [-0.135(0.039)], and parent-reported psychosocial stressors [0.761(0.171)], were significantly different from zero. Child-reported depression [-0.467(0.128)], the interaction between age and child-reported depression [0.042(0.009)], the interaction between age and parent-reported depression [0.033(0.008)], the interaction between child-reported depression and child-reported conduct disorder symptoms, positive family functioning [-0.052(0.022)], parent-reported psychosocial stressors [0.322(0.114)], and the interaction between parent-reported psychosocial stressors and parent reported family activities [-0.004(0.001)]. The variance - covariance matrix reveals significant reductions in the between-subjects variance. Significant unexplained variance remains in the intercepts of both child-reported [96.43(10.72)] and parent-reported [38.14(4.36)] drug use, as well as in change over time [8.98(1.91), 0.96(0.42)]. Unexplained within-subjects variance is also greatly reduced [child report = 19.31(2.06), parent report = 13.94(1.21)], although still significantly different from zero.

Results for child and parent reported drug use partially supported the study hypotheses. Hypothesis 1 (Individual factors will predict involvement in rule-violating behavior) was partially supported. Overall, greater child and parent reports of drug use were predicted by increased age (1a) and lower levels of child-reported depression (1d). Depression significantly interacted with age, such that older adolescents who are more depressed appear to engage in significantly more drug use than their non depressed peers, while the effect on drug use among younger children appears to be smaller and in the opposite direction, with less depression predicting more drug use. The interaction between depression and conduct disorder symptoms was also significant. Depressed adolescents with more conduct disorder symptoms appear to report greater drug use,
while among adolescents with low levels of depressive symptoms, greater drug use seems to be predicted by lower levels of conduct disorder symptoms. Pubertal status (1a), sensation seeking (1c), and impulsivity (1c) contributed significantly to the fit of the model but were not significant predictors of reported drug use. Child sex (1b) did not significantly contribute to the model fit. Hypotheses 2 (Family factors will predict involvement in rule-violating behavior) and 3 (Environmental factors will predict involvement in rule-violating behavior) were partially supported by the current results. Positive family functioning significantly predicted lower levels of both parent and child reported drug use. Children whose parents reported more psychosocial stressors and less participation in family activities were involved in more drug use, but family activities did not appear to predict drug use among children with low levels of psychosocial stressors. Marital status, parent psychopathology, marital discord, child-reported stressors, and life events improved the fit of the model but did not significantly predict drug use.

*Sexual activity.* The baseline variance components model for child-reported and parent-reported sexual activity reveals significant within-subject variance [340.89(13.51), 333.17(15.85)] as well as between-subject variance [141.20(15.88), 95.73(14.92)]. The likelihood statistic (-2*log likelihood) for the baseline model was 26338.07. Next, the impact of adding variables representing time to the model was assessed. Both fixed and random models of the linear and nonlinear impact of time on drug use were evaluated. A fixed linear model (with the slopes of individuals’ scores across time constrained to be equal) produced in the best fit to the data (-2*log likelihood= 23846.66; \(X^2(2)=2491.41, p<.00001\)). Although slopes are not allowed to vary, there exists significant unexplained
variance between individuals in the intercepts of both child-reported [141.54(16.29)] and parent-reported [100.45(15.01)] sexual activity. In addition, the covariance between the intercepts of parent-reported and child-reported sexual activity is significant [104.86(12.67)], suggesting a strong correlation between parent-reported and child-reported level of sexual activity.

Next, the predictor variables were entered into the model as previously described, and variables that significantly contributed to an increase in model fit were retained in the model. The final model for sexual activity (Table 16) contains variables representing the following: time (linear), sex of child, age of child, pubertal status, SES, conduct disorder symptoms, depression symptoms, sensation seeking, marital status, parent psychopathology, family activities, marital functioning, psychosocial stressors, and significant life events. No interaction terms contributed significantly to model fit. The likelihood statistic for the final model was 4072.15, a significant improvement over the baseline model ($\chi^2(36)=22265.92, p<.00001$). Each of the variables improved the fit of the model when they were included in hierarchical fashion. However, in the final model, not all variables remained significant predictors of individual differences in sexual activity. As predictors of child-reported sexual activity, only age of child [2.806(0.605)], child-reported conduct disorder symptoms [0528(0.212)], and parent psychopathology [10.997(4.401)] were significantly different from zero. Age of child [2.318(0.611)], sex of child [4.419(2.151)], and parent-reported conduct disorder symptoms were the only significant predictors of parent-reported sexual activity. Significant reductions were produced in the amount of between-subjects variance. Significant unexplained variance remains in the intercepts of child-reported [48.15(22.66)] sexual activity, but the variance
of parent-reported [18.59(18.11)] sexual activity does not significantly differ from zero. Unexplained within-subjects variance is also greatly reduced [child report = 234.03(26.07), parent report = 144.20 (22.00)], but remains significant.

Results for child and parent reported sexual activity provided strong support for Hypothesis 1 (Individual factors will predict involvement in rule-violating behavior). Both child and parent reports of sexual activity were predicted by increases in child age (1a). Additionally, parents reported significantly greater sexual activity among female adolescents (1b). Greater levels of conduct disorder symptoms (1d) significantly predicted more sexual activity as reported by both parents and children. Pubertal status (1a), SES, sensation seeking (1c), and depression (1d) contributed significantly to the fit of the model, but did not predict individual levels of sexual activity. Impulsivity (1c) did not significantly contribute to the model fit. Hypotheses 2 (Family factors will predict involvement in rule-violating behavior) and 3 (Environmental factors will predict involvement in rule-violating behavior) received limited support. Greater parental psychopathology (2b) predicted more child-reported sexual activity. Variables measuring marital status at first assessment, parent depression, family activities (2c), positive aspects of marital relationship, psychosocial stressors, and exposure to significant life events (3a) contributed significantly to the fit of the model, although they were not significant predictors of sexual activity. Inclusion of variables representing the primary parent’s sex and age (2a), as well as measures of disciplinary practices did not improve the fit of the model. No interaction effects significantly contributed to model fit.
CHAPTER 4

DISCUSSION

This study examined the influence of individual, family, and environmental factors on the development of rule-violating behaviors over time among a large sample of children and adolescents. While many previous studies have examined the predictors of serious risk behavior (e.g., delinquency) among at-risk children, this study has focused on the development of milder rule-violations in a sample of children and adolescents drawn from the community for a study of the impact of parental bereavement. The participants included youth who had experienced the recent death of a parent, those with diagnosed depressive disorders, and those drawn from the community at large. Thus, the sample included depressed youth, who are thought to be at elevated risk for developing conduct disorder, delinquency, or substance use, as well as bereaved children and adolescents, whose risk for involvement in rule-violating behavior is unclear, and a community control group, likely to be at low risk. Despite the participation of adolescents at various levels of risk, reported levels of unruly behavior, alcohol use, drug use, and sexual activity were quite low overall.
Strong correlations were found between different types of rule-violating behavior, particularly between alcohol use, drug use, and sexual behavior. Unruly behavior was positively related to the other behaviors, but the relationship was not robust. The initial level of involvement in each of these behaviors was also found to covary significantly with the slope of the increase over time. Thus, those individuals who reported more involvement in alcohol use, drug use, sexual activity, or unruly behavior at the first assessment also showed a greater increase in these behaviors over time. These results are consistent with the problem behavior model.

As found in previous research (Bogenschneider et al., 1998), the current results reveal significant differences between the level of parent and child reports of involvement in risk behavior. Relative to the youth, parents tended to under-report involvement in alcohol use, drug use, and sexual activity, but over-reported unruly behavior. This is not surprising, given the nature of items on the scales. It is more likely that parents will be aware of behaviors such as swearing and skipping school than substance use and sexual intercourse, which children and adolescents are more likely to take pains to hide. However, the current study demonstrated significant positive correlations between parent and child reported level of behavior as well as change over time, suggesting parents are generally aware of the activities their children are involved in, although perhaps are not always aware of the extent of the involvement.

Support for Study Hypotheses

Individual factors. Overall, the study results showed strongest support for the hypothesis that individual factors influence the pattern of rule-violating behavior over time. As hypothesized, age played a significant role in predicting increases in sexual
activity, just as previous research has demonstrated an increase in risky behaviors throughout adolescence (DiClemente et al., 1996; Gottfredson & Hirschi, 1994). Within the current study, however, the effect of age on unruly behavior, alcohol use, and drug use varies, significantly interacting with a number of other variables. This indicates that the development of rule-violating behavior across time is more complex than is sometimes suggested. While normative involvement in these behaviors may show a trend across time, many factors influence an individual’s level of rule-violating behavior.

Pubertal status was a significant predictor of alcohol use, but results were not as expected. At younger ages, pre-pubescent children appear to report higher levels of alcohol use than post-pubescent children, but this discrepancy decreases with age, and reports of drinking appear similar for the two groups around age 12. Among older adolescents, alcohol use is greater among those who have reached puberty. Overall, significant main effects suggest that levels of alcohol use are highest among younger, pre-pubescent children, and decrease with age. This effect may be somewhat of an artifact of changing base rates. At younger ages, most children are pre-pubescent, while the majority of older adolescents have reached puberty. Given this, the current results suggest that reported alcohol use is greatest among participants who are similar to peers in pubertal status. The results did not support the hypothesis that increased alcohol use would be observed after adolescents reached puberty. It also differs from previous research suggesting that children who reach puberty earlier or later than their peers may be more likely to drink alcohol and engage in sexual intercourse, perhaps due to factors such as self consciousness, lower self esteem, or a desire to fit in with peers (Graber et al., 1998; Leitenberg & Saltzman, 2000; Miller-Johnson et al., 1999; Stouthamer-Loeber
Pubertal status was included in the models for unruly behavior, drug use, and sexual activity, but again, somewhat surprisingly, was not a significant predictor variable.

Parents reported more overall involvement in sexual activity for girls than for boys, although there was no real difference in child-reported sexual behavior. This discrepancy may be due in part to parents having a greater awareness of girls’ sexual activity. Traditionally, sexual behavior among adolescent boys is seen as normative, and may escape parents’ notice. Additionally, parents may be more motivated to monitor their daughters’ sexual involvement due to the impact of potential consequences, including pregnancy. Surprisingly, no significant differences were found between males’ and females’ involvement in alcohol use, drug use, or unruly behavior, and sex did not significantly interact with any of the other predictor variables. This finding contradicts results from previous research that suggest greater involvement in problem behavior among males, particularly in the area of conduct problems (Kazdin, 1995; Lahey et al., 1999; Marcus, 1999; Silverthorn & Frick, 1999), and is consistent with studies that have failed to find significant sex differences (cf. Armstrong & Costello, 2002). These results challenge the preconception of boys as being more involved in rule-violating behavior, while girls are more innocent and obedient. On the contrary, boys and girls were equally likely to engage in rule-violating behavior in this sample. This supports the argument that different types of rule violations, including substance use, mild unruly behavior, and sexual activity, are a normative part of adolescence. The lack of sex differences observed in the current study may be due in part to the low overall levels of these behaviors among the study participants, and more significant sex differences would perhaps be noted
among youth who participate in more serious delinquent behavior or substance use. However, it is important not to discount the evidence that perhaps there are truly no differences between boys and girls in their propensity toward exploration during adolescence, and in their attraction to experimenting with illicit substances or engaging in sexual experiences.

One of the two individual personality characteristics tested, higher sensation seeking predicted increased unruly behavior and alcohol use, and contributed to the model of sexual activity. It was not included in the model for drug use due to estimation problems. These results are even more important when considering the low reliability estimate obtained for the measure of sensation seeking. Scales with low internal consistency are less likely to achieve a statistically significant effect on other variables. Thus, sensation seeking is important to consider in predicting rule violating behavior. It cannot be concluded, however, that the presence of higher sensation-seeking tendencies causes greater use of alcohol and more unruly behavior. In the current study, sensation seeking was measured only at the last assessment. Therefore, responses on this measure may have been influenced by the adolescent’s previous experiences and involvement in rule-violating behavior. In order to further examine the role of sensation seeking, future research should measure these characteristics at younger ages, prior to the onset of involvement in unruly behavior, alcohol use, drug use, and sexual activity.

Impulsivity also contributed to the model for drug use, and was a significant predictor of unruly behavior. Parents reported more unruly behavior in children with more symptoms of impulsivity. The effect appears to be greatest among younger children, and does not appear to be significant among older adolescents. This suggests
that parent-reported unruly behavior among younger children may reflect the presence of impulsive, immature behavior or problems such as Attention Deficit Hyperactivity Disorder. At older ages, however, unruly behavior may result from more deliberate choices to violate rules, perhaps due to rebelliousness or peer pressure.

As expected, individual levels of psychopathology (symptoms of depression and conduct disorder) were important in predicting levels of rule violating behavior. Depression was a significant predictor of unruly behavior, drinking and drug use, and contributed to the model for sexual behavior. Parents who reported greater depressive symptoms in their children also reported significantly more unruly behavior. The effect of depression on alcohol and drug use depends on the age of the child, and parent and child-reports differ. The impact of depression on drug use appears to be strongest among older adolescents, with more depressed adolescents appearing to use drugs at significantly higher rates. For children under the age of twelve, parents continue to report somewhat greater drug use among those whom they view as depressed, but younger children who self-report symptoms of depression seem to engage in somewhat lower levels of drug use than less depressed children. The impact of depression on parent-reported alcohol use shows a similar pattern, strongly predicting increased drinking among older adolescents, but appearing to have no significant effect among younger children. When looking at adolescents’ reports of alcohol use, however, a different effect is observed. Overall, older adolescents seem to report lower levels of depression than younger participants. Among the older adolescents, a small effect of depression is observed, but this appears to be in the opposite direction, with more depressed adolescents reporting less use of alcohol than non-depressed teens. The cause for these
different patterns is not obvious. It may be due in part to a decreased willingness to
disclose of alcohol and drug use among adolescents, particularly among those who are
depressed. Alternatively, it may be that adolescents with low levels of substance use may
self-report depression that goes unnoticed by parents. Parents may be more likely to
identify symptoms of depression in adolescents who draw their attention through
drinking and drug use. Another explanation is the fact that the depressed children and
adolescents in the study were identified because they had been diagnosed and involved in
treatment for their mood disorder. It has been proposed that effective treatment
(psychotherapy and/or psychotropic medication) of mood disorder symptoms may reduce
the likelihood of later substance use, although empirical support for this is currently
lacking (Compton, Burns, Egger, & Robertson, 2002). It is also possible that those
depressed children who drank more alcohol at younger ages were also more likely to drop
out of the study, and the interaction with age may reflect the effects of this attrition.

Symptoms of conduct disorder (e.g., fighting, school suspension, vandalism)
explained variance in all four types of rule-violating behavior. Greater reported levels of
conduct disorder symptoms predicted increased sexual activity. The impact of conduct
disorder symptoms on alcohol use and unruly behavior (e.g., telling lies, swearing, and
skipping school), is dependent on age. There seems to be no significant effect of
symptoms of conduct disorder on alcohol use among younger children, but older
adolescents with higher levels of conduct disorder symptoms appear to drink significantly
more than those with low levels of conduct disorder symptoms. A similar pattern was
observed in predicting unruly behavior. Reports of unruly behavior among younger
children seem to be slightly higher among those with lower levels of conduct disorder
symptoms. Among older adolescents, however, the presence of conduct disorder symptoms appears to significantly increase the amount of unruly behavior reported. The interaction between depression and symptoms of conduct disorder is a significant predictor of drug use, and contributed to the model of alcohol use. For participants with higher levels of depression, more reported conduct disorder symptoms appear to predict increased use of drugs, but among non-depressed youth, drug use seems to be higher among those with low levels of conduct disorder symptoms. These results suggest that the impact of conduct disorder symptoms on rule violating behavior is strongest among older adolescents, particularly among those who have more depressive symptoms. This may reflect the presence of a subset of participants who are experiencing more severe emotional disturbance, and that involvement in rule violating behavior is predicted by a different pattern of factors, in contrast to the non-depressed children in the study who may represent a more normative pattern of development and experimentation.

*Family factors.* The second primary hypothesis of the study, that family factors will influence involvement in rule-violating behavior, was partially supported. Parent marital status at the initial interview contributed to the models for all four types of rule-violating behavior, and interacted with age to significantly predict alcohol use. Adolescents whose parents were married at the time of the initial interview reported less alcohol use than those whose parents were separated, divorced, or never married. The effect appears to be most significant among older adolescents, with only slight differences reported among younger children. This suggests that growing up in a single parent household may have its strongest impact on alcohol use years later. Possible routes of influence include the impact of divorce or single parenthood on finances and
effective supervision. However, because marital status was only measured at the time of the first interview, this conclusion may be confounded by parental separation or divorce that occurred during the study. Additionally, marital status for the children who were bereaved was measured prior to the parent’s death. Thus, many of the children included in the “married” category were actually living in single-parent homes for much of the study. The impact of bereavement, divorce or parental breakup may depend on the age of the child, or the amount of conflict existing between the parents. This information is not measured in the current study. Parent demographic variables (i.e., age and sex), did not explain any variance in rule-violating behavior.

Parent psychopathology contributed to the models predicting all four types of rule violating behavior, and was a significant predictor variable for sexual activity. One possible explanation is that parents who are hampered by symptoms of depression may be less able to monitor their children’s activity. Alternatively, impaired parents may provide less support and affection to their children. They may communicate less and offer fewer cautions against adolescent sex, resulting in a greater likelihood of early sexual relationships.

The models for all four types of rule-violating behavior included variables measuring different aspects of family environment. Several of these variables appear to have a protective effect. Positive aspects of family functioning as reported at time one predicted decreases in child-reported unruly behavior and drug use, and positive qualities of parents’ marital relationships predicted less unruly behavior. Involvement in family activities predicted lower levels of alcohol use and unruly behavior, but the protective effect varies, dependent on exposure to psychosocial stressors.
Environmental factors. The third hypothesis, that environmental factors influence rule-violating behavior, received limited support. Overall, children with more reported psychosocial stressors and significant life events are involved in more unruly behavior and drug use. However, significant interactions exist between family activities and psychosocial stressors. Adolescents who are exposed to a greater number of psychosocial stressors but are also involved in activities with their families appear to engage in significantly less drug use and unruly behavior than those who do not spend time in family activities. At lower reported levels of psychosocial stressors, engaging in family activities does not seem to significantly impact unruly behavior or drug use. Psychosocial stressors also interacted with marital conflict to predict alcohol use. At high levels of psychosocial stressors, youth who reported greater amounts of conflict in their parents’ marital relationship appeared to use significantly more alcohol. At low levels of environmental stress, however, the relationship was the opposite, with low levels of marital conflict predicting more adolescent drinking. Psychosocial stressors and life events contributed to the model for sexual activity, but were not significant predictors of individual variation.

Socioeconomic status was included as a demographic variable. It explained some variance in unruly behavior, drug use and sexual activity, but did not contribute to the model for alcohol use. It was not a significant predictor variable for any of the four types of rule-violating behavior.
Broader Implications of Results

All four of the dependent variables are highly correlated within the sample, consistent with problem behavior theory, which proposes that different types of risky behavior among youth have common determinants (Farrell et al., 2000; Gottfredson & Hirschi, 1994; Igra & Irwin, 1996; Jessor, 1992; Woodward & Fergusson, 1999). Despite the strong relationships, the current models for predicting unruly behavior, alcohol use, drug use, and sexual behavior are significantly different from one another. Both the variables included in the models and the patterns of significance of predictor variables differ. This suggests that among this sample, the factors most strongly influencing the development of rule-violating behavior are specific to the type of behavior being examined, rather than commonalities (Anderson et al., 1993).

Overall, individual factors seem to account for most of the variation in sexual activity, alcohol use, drug use, and unruly behavior. However, several family factors and environmental factors appear to be important in predicting rule-violating behavior. In general, the presence of psychosocial stressors and significant life events act to increase risk for involvement in rule-violating behavior. However, family environment characteristics and involvement in family activities seem to have a protective effect on alcohol use, drug use, and unruly behavior. Improving family relationships and fostering a sense of connection with family may serve to strengthen prosocial norms and inhibit engagement in rule violations. Alternatively, spending more time with family members in cooperative activities may serve to reduce the amount of unsupervised free time, and reduce opportunities for undesired activities.
It appears that two different groups may exist within this sample. Overall, the majority of participants report relatively low levels of rule-violating behavior, with decreases or slow increases over time. However, it appears that there may be a subset of participants who are more disturbed, in terms of having greater levels of psychopathology (depression, conduct disorder symptoms). This group of adolescents appears to demonstrate greater increases in drinking, drug use, and unruly behavior as they grow older. Involvement in sexual activity appears to be an exception to this. Although increased sexual behavior is predicted by conduct disorder symptoms, it is most strongly associated with increasing age and time.

The relationships between the predictor variables and rule violating behavior may be obscured by the combination of older and younger children in the same analyses, despite the use of age as a time-varying covariate in the equation. It may be the case that the effect of age differs for younger children when compared to older adolescents. Age at initial interview was not included in the models built in the current study to reduce the likelihood of collinearity and estimation problems. However, it would be advisable for future research to investigate cohort effects.

This study is important for several reasons. While research has repeatedly shown strong correlations among different types of risk behavior in samples of at-risk youth (Arnett, 1998; DiClemente et al., 1996; Donovan, 1996; Flisher et al., 2000; Irwin & Millstein, 1991; Leitenberg & Saltzman, 2000; Rome et al., 1998; Stouthamer-Loeber & Wei, 1998; Woodward & Fergusson, 1999), the current study illustrates the relationships among four different types of rule-violating behavior in a sample of adolescents who were not selected for behavioral problems. The current sample includes youth with a
variety of risk and protective factors. Therefore, the current findings are potentially informative for a general population of youth that may experience a normative level of rebellion and rule-violating behavior, as well as those identified as being at high-risk.

Risk behavior among adolescents has been a focus of research for the past decade. However, this longitudinal study utilizes a large sample of adolescents with little serious involvement in delinquency and behavioral problems. The size of the sample, along with data collected from both parents and youth, provide enough statistical power to conduct complex analyses on the data. New methods of data analysis allow the examination of the development of rule-violating behavior over the course of time. Rather than predicting a snapshot of behavior at a single point, this study investigates the relationship of variables to the pattern of change over several time periods. Additionally, the methods allow measurement of the covariance between dependent variables over time. This has shown that the increase over time is positively correlated with the relative involvement in the behavior at the first assessment period, and that increased involvement of one type of rule-violating behavior is significantly correlated with involvement in other risky behaviors.

Multilevel modeling provides an opportunity to analyze the data in a hierarchical fashion, nesting the repeated measures within individuals. At the same time, it allows the testing of multiple predictor variables at the same time, thus reducing the amount of capitalization on chance. Most importantly for this study, this method is not affected by relatively large amounts of missing data, which is a concern in all longitudinal studies. Data obtained from individuals who participated in only part of the assessments were not discarded, as is often the case with latent growth curve models.
Limitations and Areas for Further Study

Significant limitations to the current study include limitations created by the nature of data collection. All measures were self-report, and depend on the willingness of participants to disclose the true levels of involvement in rule-violating behavior. While there was no overt reason for minimization (i.e., the children were always interviewed separately from the parents), social desirability could have played a role in the low overall levels of unruly behavior, alcohol use, drug use, and sexual activity. Another limiting factor was the procedures followed during data collection. During the administration of the DICA, established procedures dictate the administration of certain key items in each category. If no items were endorsed, then the interviewer proceeded to the next section of questions. Due to this, most participants did not answer all questions included in the scales drawn from this measure that were utilized for this study. To compensate for this problem, scales were calculated using the mean of questions answered, rather than summing the responses. The amount of missing data created difficulties in calculating the internal consistency of the scales created for the study. Efforts to calculate scale reliability using alternative methods (e.g., confirmatory factor analysis) were unsuccessful. Traditional methods of determining reliability (e.g., Chronbach’s alpha, KR-20) utilize only individuals with complete data for each item in the scale. Thus, within this sample, reliability estimates could be conducted only using a sub-sample of the study participants. This may have resulted in an incorrect estimate of the internal consistency of the scales.
Additionally, because the current study was a longitudinal design, with data collected over a period of approximately five years, not all participants completed each assessment. Some individuals dropped out of the study or were unable to be located for follow-up assessments. Missing data were therefore a significant consideration during the current analyses. The MLwiN software was selected to conduct the multilevel analyses in large part because it handles missing data well. However, one of the underlying assumptions is that the missing data is random in nature. Although there are no obvious systematic differences between those participants who completed the study or dropped out, it is possible that those who dropped out may have been more likely to be involved in increased rule-violating behavior, and that this could affect the outcome of the analyses. On a similar note, many of the participants in the study were siblings. It is possible that the results may have been affected by some impact on the independence of the data because of this fact.

Overall, levels of reported rule-violating behavior were quite low, and distributions were negatively skewed. While measures were taken to account for the lack of normal distributions by conducting non-parametric analyses, it is possible this affected the analyses. While multilevel analysis is more robust in the face of skewed distributions, it also may have been impacted. The models created in the current study were exploratory in nature and dependent upon variations within the dataset utilized. In order to confirm the generalizability of the results, the models should be tested in other samples.
This study does not address several important factors that are thought to influence the development of rule-violating behavior. While family structure and environmental characteristics were measured in the study, communication with parents may be more important than the amount of time spent together or the strictness of perceived parental control (Deater-Deckard et al., 1998; Garnier & Stein, 1998; Igra & Irwin, 1996; Kerr & Stattin, 2000). The important contribution of peer influences, including the presence or absence of supportive peer relationships and the degree of involvement of peers in rule violations, was not measured in this longitudinal study. Additionally, important characteristics such as self esteem, school performance, and involvement in positive community activities are important factors that are likely to affect involvement in rule violating behavior.

The current study does not assess involvement in thrill-seeking behavior, such as skateboarding or parachuting, which may be related to engaging in rule-violating behavior (Gullone et al., 2000). Inclusion of these factors would allow the examination of whether rule-violating behavior is related to risk-taking as opposed to rebelliousness or nonconformity. Also, results of the current study suggest that participants are not overly involved in serious delinquent behavior, substance use and sexual activity. Thus, the results may not generalize to populations of adolescents involved in serious problem behavior.

Summary and Conclusions

The current study examined the impact of multiple individual, family, and environmental factors on the development of rule violating behavior in a large sample of children and adolescents. The influence of a variety of risk and protective factors were
examined, as well as some of the interactions between variables. The data supported many of the proposed hypotheses, but also provided some surprising results. No effects were found for SES or gender, with the exception of female adolescents reporting more sexual activity than males. Many variables were found to interact with age in predicting rule-violating behavior. Contrary to expectations, early attainment of puberty did not predict increased substance use. Rather, drinking was increased among those with relatively normative physical development. Sensation seeking predicted greater involvement in unruly behavior and alcohol use. Impulsivity predicted more unruly behavior, but only among younger children. Parent-reported depressive symptoms were associated with increased unruly behavior, and with greater alcohol and drug use in older adolescents. However, self-reported depressive symptoms were associated with less drug use among younger children, and with lower levels of drinking among adolescents. Symptoms of more serious conduct disordered behavior were associated with more involvement in sexual activity, and predicted greater alcohol use and unruly behavior among older adolescents. For younger children, unruly behavior and symptoms of conduct disorder seem to be distinct constructs. Conduct disorder symptoms and depressive symptoms interacted, with drug use most prevalent among youth with comorbid symptoms of depression and conduct disorder and among those with neither type of symptoms. This suggests that the impact of individual personality traits and psychopathology differs for different groups of children and adolescents, and the effect within a high-risk sample is likely to differ from the impact on a normative developmental pattern.
Family factors were generally protective in nature, with positive family functioning predicting less unruly behavior and drug use, and improved quality of parental relationships predicting decreased unruly behavior. Older adolescents who were living in a two-parent family immediately prior to study entry reported less alcohol use. Parent psychopathology was associated with greater involvement in sexual activity. Children who were exposed to greater levels of psychosocial stressors and significant life events reported more rule-violating behavior. However, family factors interacted in a protective manner to moderate this effect. At higher levels of environmental stress, involvement in family activities predicted less drinking and unruly behavior. These findings have implications for interventions within high-risk samples of youth who are experiencing a number of stressors.

Further examination of the possible presence of subgroups within the sample is warranted. Cohort effects may be present but undetected, or differential attrition may be influencing the data. Additionally, the conclusions are drawn specifically from the current data, and must be confirmed in other samples of children and adolescents before generalizations can be made regarding the population at large. However, the current study provides confirmation of several hypotheses while raising questions about others, based on generally accepted conceptualizations of the normative pattern of rule-violating behavior. Through examination of multiple factors within a combined model, a more comprehensive picture of the complex influences on adolescent rule-violating behavior begins to emerge.
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Table 1: Scale Reliability within Exploratory Sample (scale development)
Table 1: Scale Reliability within Exploratory Sample (scale development) (continued)

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### Table 3: Demographic Variables

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<th>Time 5</th>
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<td>224 (50.7%)</td>
<td>202 (51.1%)</td>
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<tr>
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<td>218 (49.3%)</td>
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<td>179 (48.5%)</td>
<td>148 (48.2%)</td>
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### Table 4: Mean Levels of Rule-Violating Behavior

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<td>10.58 (21.2)</td>
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<tr>
<td>Child report</td>
<td>10.59 (25.4)</td>
<td>7.23 (20.4)</td>
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<td>12.14 (26.8)</td>
<td>23.52 (33.4)</td>
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<td>Time 2</td>
<td>Time 3</td>
<td>Time 4</td>
<td>Time 5</td>
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Table 5: Mean Levels of Rule-Violating Behavior - Males

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Table 6: Mean Levels of Rule-Violating Behavior - Females
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Table 7: Differences between Parent and Child Reports of Rule-Violating Behavior
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<th>Alcohol (parent)</th>
<th>Drug (child)</th>
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*p<.05, **p<.01

Table 8: Correlations between Dependent Variables at Time 1

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<th>Sex (child)</th>
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<th>Conduct (child)</th>
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*p<.05, **p<.01

Table 9: Correlations between Dependent Variables at Time 2
### Table 10: Correlations between Dependent Variables at Time 3

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<th>Spearman’s ρρο</th>
<th>Sex (child)</th>
<th>Sex (parent)</th>
<th>Alcohol (child)</th>
<th>Alcohol (parent)</th>
<th>Drug (child)</th>
<th>Drug (parent)</th>
<th>Conduct (child)</th>
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<tr>
<td>Sexual Activity (child report)</td>
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<td>Alcohol Use (parent report)</td>
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<td>Drug Use (parent report)</td>
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<td>0.087</td>
<td>0.232**</td>
<td>0.181**</td>
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*p<.05, **p<.01

### Table 11: Correlations between Dependent Variables at Time 4

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<th>Alcohol (parent)</th>
<th>Drug (child)</th>
<th>Drug (parent)</th>
<th>Conduct (child)</th>
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<td>Sexual Activity (child report)</td>
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<td>Drug Use (child report)</td>
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<td>0.551**</td>
<td>0.396**</td>
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<td>Drug Use (parent report)</td>
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<td>0.231**</td>
<td>0.433**</td>
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<td>Unruly Behavior (child report)</td>
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*p<.05, **p<.01
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<td>0.427**</td>
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<tr>
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<td>0.172**</td>
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<td>0.169**</td>
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*p<.05, **p<.01

Table 12: Correlations between Dependent Variables at Time 5
Table 13: Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Unruly Behavior.
Table 13: Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Unruly Behavior (continued).

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<td>Positive aspects</td>
<td>-0.113 (0.041)</td>
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<td>Negative aspects</td>
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<td>-0.021 (0.067)</td>
<td>0.013 (0.062)</td>
<td>-0.015 (0.068)</td>
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<td>0.046 (0.037)</td>
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<td>-0.029 (0.038)</td>
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<td>-0.034 (0.057)</td>
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<tr>
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<td>0.033 (0.041)</td>
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</table>

| Step 6 | Stressors               | Child Report 0.121 (0.076) 1.183 (0.278)† 0.132 (0.088) 1.189 (0.321)† | Parent Report -0.052 (0.069) -0.036 (0.066) 0.138 (0.080) 0.113 (0.077) | Life Events 0.004 (0.002) 0.004 (0.002) 0.010 (0.02) 0.010 (0.002) | Life Changes Child Report -0.027 (0.035) -0.013 (0.040) | Parent Report 0.016 (0.029) 0.022 (0.033) | Stressors x Family Activities (CR) -0.013 (0.003) -0.013 (0.003)† -0.013 (0.004) -0.013 (0.004)† |
|        |                         | 5781.84            |                | 2468.82 (10)****    | 5782.64        | 26.56 (10)*       |         |

* p ≤ .01  ** p ≤ .001  *** p ≤ .0001  **** p ≤ .00001  † significant predictor variable
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<th>Effect</th>
<th>Child Report</th>
<th>Parent Report</th>
<th>-2*log-likelihood</th>
<th>(X^2) ((d/f))</th>
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<td>0.095 (0.939)</td>
<td>-0.207 (1.433)</td>
<td>0.038 (0.838)</td>
<td>0.862 (1.518)</td>
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<td>0.551 (0.146)</td>
<td>0.084 (0.257)</td>
<td>0.803 (0.154)</td>
<td>0.101 (0.282)</td>
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<td>-0914 (0.762)</td>
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<td>Age</td>
<td>3.565 (0.307)</td>
<td>-4.056 (1.247)</td>
<td>1.647 (0.263)</td>
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<td>Pubertal Status</td>
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<td>-40.290 (7.157)</td>
<td>2.349 (1.535)</td>
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<td>2.683 (1.100)</td>
<td>0.213 (0.892)</td>
<td>-0.276 (0.944)</td>
<td>-0.286 (0.486)</td>
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<td>SES UTE</td>
<td>UTE</td>
<td>UTE</td>
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<tr>
<td>Age x Puberty</td>
<td>3.450 (0.687)</td>
<td>3.385 (0.658)</td>
<td>2.883 (0.524)</td>
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<td>12575.60 (14)****</td>
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<td>-0.050 (0.071)</td>
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<td>0.343 (0.056)</td>
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<td>0.066 (0.094)</td>
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<tr>
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<td>0.061 (0.039)</td>
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<tr>
<td>Parent Report</td>
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<td>0.001 (0.027)</td>
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<td>Sensation Seeking</td>
<td>10.258 (7.044)</td>
<td>17.282 (7.900)</td>
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<td>Age x Conduct Disorder (CR)</td>
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<td>0.024 (0.027)</td>
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<td>Age x Depression (CR)</td>
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<td>Age x Depression (PR)</td>
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<td>Depression x Conduct Disorder (CR)</td>
<td>0.000 (0.005)</td>
<td>0.005 (0.006)</td>
<td>0.004 (0.004)</td>
<td>0.002 (0.004)</td>
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</table>

Table 14: Summary of Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Alcohol Use.
Table 14: Summary of Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Alcohol Use (continued).

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<td>0.004 (0.001)†</td>
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*p ≤ 0.05  **p ≤ 0.01  ***p ≤ 0.001  ****p ≤ 0.0001  †significant predictor variable
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<td>† 0.692 (0.142)</td>
<td>7433.46 (10)****</td>
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<td>0.465 (0.789)</td>
<td>† 0.678 (0.752)</td>
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<td>Sensation Seeking</td>
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<td>Age x Conduct Disorder (PR)</td>
<td>0.053 (0.015)</td>
<td>0.025 (0.021)</td>
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<td>Age x Depression (CR)</td>
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<td>0.042 (0.013)</td>
<td>0.011 (0.006)</td>
<td>0.042 (0.009)†</td>
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<td>Age x Depression (PR)</td>
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<td>0.014 (0.012)</td>
<td>0.022 (0.006)</td>
<td>0.033 (0.008)†</td>
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<td>Age x Impulsivity (CR)</td>
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<td>0.0003 (0.010)</td>
<td>0.011 (0.005)</td>
<td>0.005 (0.007)†</td>
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<td>Age x Impulsivity (PR)</td>
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<td>0.011 (0.009)</td>
<td>0.005 (0.004)</td>
<td>0.004 (0.006)†</td>
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<td>Sex x Conduct Disorder (PR)</td>
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<td>-0.058 (0.133)</td>
<td>0.232 (0.083)</td>
<td>0.063 (0.091)†</td>
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<td>Depression x Conduct Disorder (CR)</td>
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<td>0.013 (0.004)†</td>
<td>0.007 (0.002)</td>
<td>0.019 (0.002)†</td>
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Table 15: Summary of Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Drug Use.
Table 15: Summary of Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Drug Use (continued).

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<td>0.063 (0.071)</td>
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<td><strong>Step 5</strong></td>
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<tr>
<td>Parent Report</td>
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<td>0.006 (0.019)</td>
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<tr>
<td>Positive aspects</td>
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<td>-0.135 (0.039)</td>
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<tr>
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<td>-0.053 (0.021)</td>
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<td>Life Changes</td>
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<tr>
<td>Child Report</td>
<td>0.027 (0.024)</td>
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<td>Parent Report</td>
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<td>Stressors x Family Activities (PR)</td>
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*p ≤ .05  **p ≤ .01  ***p ≤ .001  ****p ≤ .0001  †significant predictor variable
## Table 16: Summary of Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Sexual Activity

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<th>Parent Report</th>
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<td>B (SE)</td>
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<td>0.52 (0.21)</td>
<td>0.13 (0.17)</td>
</tr>
<tr>
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<td>0.14 (0.09)</td>
<td>0.10 (0.11)</td>
<td>0.00 (0.09)</td>
</tr>
<tr>
<td>Impulsivity</td>
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<td>-0.03 (0.08)</td>
<td>0.01 (0.08)</td>
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<tr>
<td>Sensation Seeking</td>
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<td>6.29 (0.49)</td>
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<td>Parent Report (PR)</td>
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<td>0.00 (0.09)</td>
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<td>Conduct Disorder</td>
<td>0.29 (0.16)</td>
<td>0.52 (0.21)</td>
<td>0.13 (0.17)</td>
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<tr>
<td>Depression</td>
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<td>0.10 (0.11)</td>
<td>0.00 (0.09)</td>
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<td>0.01 (0.08)</td>
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<td>6.29 (0.49)</td>
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<td>Parent Report (PR)</td>
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<td>0.00 (0.09)</td>
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<td>Conduct Disorder</td>
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<td>0.52 (0.21)</td>
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<tr>
<td>Depression</td>
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<td>0.01 (0.08)</td>
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<td>6.29 (0.49)</td>
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<tr>
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Table 16: Summary of Hierarchical Multivariate Multi-Level Analyses of Child and Parent-Reported Sexual Activity (continued).

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*95

4072.15 15.07 (16)

*p ≤ .01  **p ≤ .001  ***p ≤ .0001  ****p ≤ .00001  †significant predictor variable
APPENDIX B

FIGURES
1. Do you often argue with your parents, your teachers, or other adults?
2. Do you ever just refuse to do things that your teachers or other adults have asked you to do?
3. Do you swear a lot or use what most people would consider to be bad language even in front of adults?
4. Do people complain that you bully other children or are mean to them?
5. Have you ever been suspended from school?
6. Have you ever skipped school?
7. Have you ever stolen anything, like money from someone’s purse or shoplifted something at a store?
8. Do you often tell lies for no reason at all?

Figure 1: Unruly Behavior Subscale

1. Have you ever taken a drink of beer, wine, or other alcohol (do not count sips given by parents on social occasions)?
2. Have you ever been drunk?
3. Have any members of your family or any of your friends ever told you that you were drinking too much?
4. Have you ever had “blackouts” – that is, you did something while you were drinking and you couldn’t remember having done it (e.g., the only way you found out about it is that someone told you about it. Like you can’t remember how you got home, or friends say you shouted at them but you can’t remember any shouting)?
5. Have you ever tried to stop or cut down on drinking but found that you couldn’t?
6. Have you ever found that you needed to drink more and more in order to feel high?

Figure 2: Alcohol Use Subscale

1. Have you ever smoked cigarettes?
2. Have you ever sniffed glue or other fumes like hairspray to get high?
3. Have you ever smoked marijuana?
4. Have you ever taken “street drugs” (e.g., cocaine, crack, speed, uppers, or downers)?
5. Have you taken any other drugs that weren’t prescribed for you by a doctor (e.g., getting valium or sleeping pills from a friend, or swiping some from your parent’s prescription)?

Figure 3: Drug Use Subscale

1. Do you have or have you had a steady girlfriend/boyfriend?
2. With how many different people, if any, have you had sexual relations?
3. Have you ever been pregnant/made a girl pregnant?
4. Have you ever had sex with another (person of the same sex)?
5. Have you had sex before the age of 15?

Figure 4: Sexual Activity Subscale
1. Was there ever a time in your life when you felt sad, miserable and depressed a lot more than usual (not just ordinary ups and downs, but hurting really badly)?
2. Was there ever a time in your life when you felt tearful or sad but you didn’t know why?
3. Was there ever a time in your life when you found yourself being snappish, irritable (crabby or cranky) a lot more than usual?
4. Have you ever felt like nothing you did seemed to be any fun (even things you used to like doing, like doing things with your friends)?
5. Has there ever been a time when you didn’t feel like doing any of your favorite things?
6. When they are having a hard time, many people don’t feel very hungry and sometimes they even lose weight. Has there ever been a time when you were not very hungry a lot of the time (at a time when you weren’t sick)?
7. Sometimes when people feel low, instead of losing weight they find that they are hungry all of the time. Has this ever happened to you?
8. Have you ever had a lot more trouble than usual falling asleep at night (not just one night, but most nights, say for a week or longer)?
9. Sometimes when kids feel sad and worried, they wake up in the middle of the night and can’t get back to sleep even though they try. Has this ever happened to you?
10. Have you ever awakened early in the morning a lot earlier than usual and couldn’t get back to sleep no matter how hard you tried?
11. Has there ever been a time when you were feeling sad and you slept more than usual during the day or night?
12. Has there ever been a time when you felt more restless than usual and had difficulty sitting still?
13. Has there ever been a time when you felt slowed down and it took you longer to move around or do things?
14. Has there ever been a time when you’ve felt more tired than usual, or dragged out a lot of the time (like you didn’t have the energy to do anything, when just getting up and walking around was hard to do, and you weren’t sick)?
15. Has there ever been a time when you felt that everything you did was wrong and nothing would ever go well for you (e.g., you felt like you were always saying the wrong things, or that your friends didn’t really like you. Everybody feels that way some of the time – was it a lot more than usual)?
16. Has there ever been a time when you felt that everything was your fault and you felt guilty about a lot of things (you felt your family would be better off without you or that if your parent was in a bad mood it was because of you)?
17. Has there ever been a time when you couldn’t keep your mind on your work and your parents and teachers complained about it a lot (did it seem to you that you were daydreaming a lot)?
18. Have you ever thought that life was hopeless and that there was nothing good for you in the future?
19. Have you ever thought a lot about death or dying?
20. Have you ever wished that you were dead?
21. Did you ever have a plan about how you were going to kill yourself?
22. Have you ever tried to kill yourself?

Figure 5: Depression Subscale
1. Have you ever been expelled from school?
2. Have you ever stolen things (other than shoplifting)?
3. Have you ever set any fires that you weren’t supposed to?
4. Have you ever run away from home overnight or longer?
5. Have you ever gotten into physical fights with other kids?
6. When you have been fighting, have you ever used other things in addition to your hands, such as sticks, rocks, or sharp objects (or a knife or a gun)?
7. Have you ever mugged someone or held them up and robbed them?
8. Were you ever so angry with someone that you tried to hurt them in some way?
9. Have you ever wrecked someone else’s property (e.g., breaking windows, scratching a car), or broken into a building or someone’s house to wreck things or steal things?
10. Have you ever injured or killed an animal such as a cat, a dog, or a squirrel (not ordinary insect killing or hunting activities)?

**Figure 6: Conduct Disorder Subscale**

1. Do you/did you have trouble in school because it was hard for you to sit in your seat a long time (in the classroom, was the teacher always telling you to go back to your seat)?
2. Are/were people always telling you to sit still or to stop moving or squirming about (fidgeting in your seat, playing with your hands and fingers, never able to sit still)?
3. Is/was it hard for you to play quietly, either by yourself or with other kids (were they always telling you that you were too noisy, that you were always running around, or that you never played quietly)?
4. Do/did people tell you that you talked all the time or that you never stopped talking?
5. When you are/were playing by yourself or with other kids would you say that you got restless pretty quickly and wanted to move on to something else (did you get tired of doing one thing even if the other kids didn’t want to stop, or did you have trouble sticking to one thing)?
6. Do/did the teachers or other people complain that you were always interrupting them or butting into their conversation (did your friends get mad at you because they said you were always butting into their games, or interrupting them in some way)?
7. Do/did your teachers or parent say that you started answering a question before they finished asking it (that you started talking before they were finished)?
8. Do/did you find it hard waiting your turn when you were playing with other children or waiting in line (would you get restless or start crowning around or pushing ahead in line, like maybe when you were lined up to see a movie or something)?
9. Do/did people get upset with you for doing dangerous things, like running out into the street without looking (climbing up on things that were dangerous or that you might fall off of)?
10. Do/did people tell you that you were messy or sloppy with your work or in the way that you dress?

**Figure 7: Impulsivity Subscale**
What kinds of things does your mom/dad/stepparent do with you?
1. Go on outings, physical activities, sports (primary caregiver)
2. Go on outings, physical activities, sports (secondary caregiver)
3. Play games, watch TV, spend quiet time (primary caregiver)
4. Play games, watch TV, spend quiet time (secondary caregiver)
5. Household chores, homework (primary caregiver)
6. Household chores, homework (secondary caregiver)
7. Talk (primary caregiver)
8. Talk (secondary caregiver)

Figure 8: Family Activities Subscale

1. Overall, do you think your (primary caregiver) does a lot of things with you?
2. Overall, do you think your (secondary caregiver) does a lot of things with you?
3. Does your (primary caregiver) show interest in your friends and activities by asking about them?
4. Does your (secondary caregiver) show interest in your friends and activities by asking about them?
5. Does your (primary caregiver) make a big deal out of your birthday?
6. Does your (secondary caregiver) make a big deal out of your birthday?
7. Does your (primary caregiver) make a big deal out of holidays?
8. Does your (secondary caregiver) make a big deal out of holidays?
9. Does your (primary caregiver) usually come when you are in a school performance or sporting game?
10. Does your (secondary caregiver) usually come when you are in a school performance or sporting game?
11. Some parents enjoy doing things with their children, while others do things mainly out of a sense of duty. Do you feel like your (primary caregiver) does things with you because he/she enjoys it or because it is her/his duty?
12. Some parents enjoy doing things with their children, while others do things mainly out of a sense of duty. Do you feel like your (secondary caregiver) does things with you because he/she enjoys it or because it is her/his duty?
13. Some parents show a lot of affection toward their kids, while others do not. Is your (primary caregiver) affectionate with you through hugs and kisses?
14. Some parents show a lot of affection toward their kids, while others do not. Is your (secondary caregiver) affectionate with you through hugs and kisses?
15. In general, do you think it is easy or hard to talk to your (primary caregiver) about your problems?
16. In general, do you think it is easy or hard to talk to your (secondary caregiver) about your problems?
17. If you had to make an important decision, would you ask and rely on your (primary caregiver)’s advice?
18. If you had to make an important decision, would you ask and rely on your (secondary caregiver)’s advice?
19. If someone treated you badly or upset you, could you go to your (primary caregiver) for comfort?
20. If someone treated you badly or upset you, could you go to your (secondary caregiver) for comfort?
21. Parents react differently when their children feel bad - some comfort their children, while others ignore them or tell them to “snap out of it.” When you feel sad or mistreated, what does your (primary caregiver) do?
22. Parents react differently when their children feel bad - some comfort their children, while others ignore them or tell them to “snap out of it.” When you feel sad or mistreated, what does your (secondary caregiver) do?

Figure 9: Family Functioning (Positive) Subscale
1. Does your (primary caregiver) ever complain about having too many kids (e.g., does she/he ever say she/he wishes you were never born)?
2. Does your (secondary caregiver) ever complain about having too many kids (e.g., does she/he ever say she/he wishes you were never born)?
3. Some parents frequently criticize or find fault with their kids, while others do not. Does your (primary caregiver) criticize you a lot?
4. Some parents frequently criticize or find fault with their kids, while others do not. Does your (secondary caregiver) criticize you a lot?
5. Does your (primary caregiver) ever tell you he/she doesn’t love you or hates you?
6. Does your (secondary caregiver) ever tell you he/she doesn’t love you or hates you?
7. Some parents aren’t home often, because they’re visiting friends, shopping, playing sports or cards. Is your (primary caregiver) gone a lot for reasons like this?
8. Some parents aren’t home often, because they’re visiting friends, shopping, playing sports or cards. Is your (secondary caregiver) gone a lot for reasons like this?
9. Does/did your (primary caregiver) forget to do the things that she/he says she/he will? Did/does she/he break his/her promises?
10. Does/did your (secondary caregiver) forget to do the things that she/he says she/he will? Did/does she/he break his/her promises?
11. Do you feel like your (primary caregiver) gives you responsibilities you aren’t old enough for?
12. Do you feel like your (secondary caregiver) gives you responsibilities you aren’t old enough for?
13. Does your (primary caregiver) put too much pressure on you to do well in school?
14. Does your (secondary caregiver) put too much pressure on you to do well in school?
15. Does your (primary caregiver) put too much pressure on you to do well in sports?
16. Does your (secondary caregiver) put too much pressure on you to do well in sports?
17. Does your (primary caregiver) put too much pressure on you to be artistic or musical?
18. Does your (secondary caregiver) put too much pressure on you to be artistic or musical?
19. Does your (primary caregiver) put too much pressure on you to only play with kids she/he knows and approves of?
20. Does your (secondary caregiver) put too much pressure on you to only play with kids she/he knows and approves of?
21. Does your (primary caregiver) put too much pressure on you to be religious?
22. Does your (secondary caregiver) put too much pressure on you to be religious?
23. Does your (primary caregiver) put too much pressure on you to always be polite and obedient?
24. Does your (secondary caregiver) put too much pressure on you to always be polite and obedient?

Figure 10: Family Functioning (Negative) Subscale
1. Is there someone in your family whose needs always come first, or is everyone taken into consideration?
2. Do you help with the chores?
3. Does your (primary caregiver) often let you bring home friends to play?
4. Does your (secondary caregiver) often let you bring home friends to play?
5. Does your (primary caregiver) let you go to a friend’s house or go out to play after school?
6. Does your (secondary caregiver) let you go to a friend’s house or go out to play after school?
7. Do you have rules about when your homework is to be done?
8. Are you not allowed to smoke or drink?
9. Do your parents keep you from reading books or seeing movies that they feel are not appropriate or too old for you?
10. Do you feel your (primary caregiver) is too strict, about right, or not strict enough?
11. Do you feel your (secondary caregiver) is too strict, about right, or not strict enough?
12. Does your (primary caregiver) generally keep the same rules for you to follow, is she/he pretty consistent about rules?
13. Does your (secondary caregiver) generally keep the same rules for you to follow, is she/he pretty consistent about rules?
14. Are you allowed to openly disagree with your (primary caregiver)?
15. Are you allowed to openly disagree with your (secondary caregiver)?
16. Do you think your (primary caregiver) is generally fair in scolding or punishing?
17. Do you think your (secondary caregiver) is generally fair in scolding or punishing?

Figure 11: Rules and Discipline (Positive) Subscale

1. Do you think your (primary caregiver) has a favorite child?
2. Do you think your (secondary caregiver) has a favorite child?
3. Is there a child with whom your (primary caregiver) is particularly strict?
4. Is there a child with whom your (secondary caregiver) is particularly strict?
5. Does your (primary caregiver)’s work keep her/him away from home a lot (e.g., evening hours, out of town, second job)?
6. Does your (secondary caregiver)’s work keep her/him away from home a lot (e.g., evening hours, out of town, second job)?
7. What is the usual way your (primary caregiver) punishes or scolds you (scold, isolate, ground, deprive of privileges, mild physical, harsh physical).
8. What is the usual way your (secondary caregiver) punishes or scolds you (scold, isolate, ground, deprive of privileges, mild physical, harsh physical).
9. Did your (primary caregiver) ever scold, punish or hit you in front of people outside of the family?
10. Did your (secondary caregiver) ever scold, punish or hit you in front of people outside of the family?
11. When you do something wrong are you often spanked (or physically harmed) by your (primary caregiver)?
12. When you do something wrong are you often spanked (or physically harmed) by your (secondary caregiver)?
13. Are there a lot of quarrels or fighting between you and your brothers and sisters?

Figure 12: Rules and Discipline (Negative) Subscale
1. Do/did your mom and dad often go out together (e.g., to parties, movies or dinner)?
2. Do/did your mom and dad often do household chores together?
3. Do/did your mom and dad often watch television / spend quiet time (e.g., reading, etc.) together?
4. Do/did your mom and dad often talk to each other?
5. Do/did your parents share the same friends or do / did they each have their own set of friends and activities?
6. Some parents really enjoy being together while others don’t. Do/did your parents seem to enjoy each other?
7. Does/did your (primary caregiver) seem pretty happy about her/his life, or does/did she/he complain about it?
8. Does/did your (secondary caregiver) seem pretty happy about her/his life, or does/did she/he complain about it?
9. Do/did your parents share in decision making, or does/did one usually make all of the major decisions or have the last word?

Figure 13: Marital Functioning (Positive) Subscale

1. Does/did your (primary caregiver) get angry a lot or lose his/her temper a lot?
2. Does/did your (secondary caregiver) get angry a lot or lose his/her temper a lot?
3. Overall, do/did your parents get along well with each other, or do/did they have many quarrels?
4. Do/did they quarrel about child rearing or discipline?
5. Do/did they quarrel about money?
6. Do/did they quarrel about someone they were jealous of?
7. Do/did they quarrel about one parent being away too much?
8. Do/did they quarrel about drinking?
9. Do/did they quarrel about other things?
10. Do/did your parents argue in front of you?
11. Did one of your parents ever hit the other one?
12. Did one of your parents ever walk out on the family for at least one week?

Figure 14: Marital Functioning (Negative) Subscale
1. Since we last talked with you, have you moved?
2. Has there been a change in who lives in your home?
3. Have your mom/dad/parents changed jobs or occupations?
4. Is the amount of money that your mom/dad/parents have now different than it was three years ago?
5. Within your family, has there been a change in the amount and type of overall time spent together?
6. Within your family, has there been a change in the amount and type of fun things done together?
7. Within your family, has there been a change in the amount and type of work-related activities done together?
8. Has there been a change in religious practices in your home?
9. Have there been any other changes in your home/family life that you would like to tell me about?

Figure 15: Changes Subscale

1. Is there a lot of quarreling and fighting in the family which bothers you a lot?
2. Have any close relatives separated or divorced since you can remember?
3. Are there big money worries, like not having enough money for food or new clothes, or to pay the rent?
4. Is someone in the family seriously ill, handicapped or crippled so that you worry about it?
5. Has someone you cared a lot about died?
6. Does anyone drink a lot and cause disturbances at home which worries you?
7. Does anyone from your home have problems with the police?
8. Are you scared that someone who lives in or comes to your home might hurt you or someone else there?
9. Have you ever been beaten so that you had bruises or marks on your body or were hurt in some way?
10. Has anyone else in the family been hurt like that, beaten up or knocked around by someone else?
11. Has someone you have known quite well been killed by someone or by accident?
12. Has any older person tried to do anything with you sexually – like make you undress, touch you between the legs, make you get into bed with him/her, or make you play with his/her privates?
13. Have you ever been forced to have sex by someone threatening to hurt or kill you?

Figure 16: Psychosocial Stressors Subscale
REFERENCES


Cerel, J. (2001). The Role of Family Factors in Childhood Depression. Unpublished dissertation, The Ohio State University, Columbus, OH.


