

Introduction

Violent Behavior in Adolescence

Violent behavior is a concern at many points in the lifespan, but adolescence is a period of particular concern for several reasons. First, it is a time of heightened violence, as shown by the “age-crime curve”: overall rates of criminal violence rise sharply early in adolescence, peak, and then begin to decline as adulthood is entered (Blumstein, 1995; Farrington, Lambert, & West, in press; Moffitt, 1993). Second, certain forms of adolescent violence appear to be increasing. From the mid-1980's through 1995, there was an estimated 67% increase in juvenile arrest rates for Violent Crime Index offenses (murder, nonnegligent manslaughter, forcible rape, robbery, and aggravated assault). Concern exists that this overall trend may continue into the next century, in spite of evidence of a small decrease in violent juvenile crime between 1994 and 1995 (Fox, 1996; Snyder, 1997). Moreover, youth violence has become increasingly more lethal. The adolescent homicide rate showed steep increases from 1988 into the mid-1990s, particularly for younger adolescents; homicide arrests declined for adults over 25 during the same period (Centers for Disease Control, 1997; Grisso, 1993). Juveniles commit approximately 10 murders each day (U.S. Department of Justice, 1992). Within the past 16 months, there have been several nationally recognized in-school shootings committed by adolescents, which resulted in 19 deaths (King and Murr, 1998). These incidents have created a recent resurgence of interest in the problem of youth violence from political leaders, school personnel, and the media.

Impressive evidence exists of long-term stability in patterns of aggressive behavior from childhood, through adolescence and adulthood, and even between generations (Huesmann, Eron, Lefkowitz, & Walder, 1984; Olweus, 1979; Widom, 1989). Yet, in spite of this stability, important changes in violent and aggressive behavior may occur over time such that some youths outgrow aggression (Loeber & Stouthamer-Loeber, 1998). In particular, a significant number of adolescents previously displaying high levels of aggression greatly reduce these levels in late adolescence, and often desist from aggression completely as they mature (Blumstein, Cohen, & Farrington, 1988). For example, even among the most violent juveniles, almost 25% may never re-enter the criminal justice system as adults (Lewis, Lovely, Yaeger, & Femina, 1989). In a study of violent juvenile delinquent career patterns, Elliott and colleagues found that, over a four year period, a majority of those classified as serious violent offenders were so classified only for a single year. They concluded that for many violent offenders, involvement in serious violent behavior seems short-lived (Elliott, Huizinga, & Morse, 1986). Arrest history studies have shown that a majority of violent juvenile offenders have a single arrest for a serious violent offense and that relatively few continue their violent offending into the adult period (Hamparian, Schuster, Dinitz, & Conrad, 1978; Snyder, 1998).

Over the course of adolescence, the degree of *instability* of aggression appears approximately equal in magnitude to its stable aspects (Blumstein et al., 1988; Huesmann et al., 1984). Observed reductions in juvenile violent behavior may result both from changes in social environments as well as from developmental changes and maturation. The existence of

reductions in violence is absolutely critical to intervention efforts, because it indicates the existence of naturally occurring processes through which change in aggressive behavior may occur. An understanding of these processes should guide efforts to intervene to produce changes in youth violence and aggression.

The study of changes in violence during mid- to late adolescence is worthwhile for several reasons. First, recent evidence shows promise for successful intervention with violent adolescents. The most effective programs to date use intensive interventions that address numerous risk factors adolescents face across multiple contexts (Tate, Reppucci, & Mulvey, 1995; Wasserman & Miller, 1998). Research is needed to hone and specify our knowledge of individual and familial processes that are related to changes in adolescents violent behavior. One of the main foci of this study involves a thorough assessment of family relations and family functioning. Such information could advance family-based efforts to rehabilitate violent juveniles. Second, schools represent one of the last institutional opportunities to reduce or prevent violence before adolescents reach adulthood. Indeed, school-based violence prevention programs are becoming increasingly utilized (Catalano, Arthur, Hawkins, Berglund, & Olson, 1998; Selman, Schultz, Nakkula, & Barr, 1992; Weiler & Dorman, 1995). Understanding developmental sequelae that lead to changes in violent behavior during this age range will help design the most informed prevention strategies. Because this study uses a school-based sample, findings may be especially germane to school-based prevention programs. Third, by age 18 (and often prior to age 18), adolescents are legally considered

adults and must face serious consequences for violent behavior under the auspices of the adult criminal justice system. Therefore, reduction or cessation of violent behavior during this time may dramatically alter the future for some adolescents.

In sum, meaningful change occurs in both the nature and level of violent and aggressive behavior in late adolescence. Understanding this change is a critical step needed to fortify prevention and intervention efforts aimed at reducing the incidence of adolescent violent behavior. Such efforts must seek both to target potentially violent adolescents and to select the most appropriate interventions. In order to make advances towards the achievement of these goals, two questions must be addressed: (1) Based on present information, who is at elevated risk for exhibiting violent behavior in the future?; and (2) What processes are central to producing *increases or decreases* in violent behavior? The overarching objective of this research project is to address these two questions using multiple methods and multiple measures to assess the quality of functioning within different domains of adolescents' lives.

Definitions

Violence has been defined in different ways in the literature. Many psychologists and criminologists have adhered to a definition of violence that includes only the most serious violent behaviors (i.e. homicide, rape, aggravated assault, and robbery), or aggressive behaviors that cause “serious harm” (Farrington & Loeber, 1998; Loeber & Stouthamer-Loeber, 1998). The broader construct of aggression embodies actions that are intrusive, attacking, harmful physically or psychologically, or intended to cause harm (Baron & Richardson, 1994;

Leventhal, 1984; Loeber & Hay, 1997). Aggressive behaviors have been considered by some as causing less than serious harm to others than violent behaviors (Loeber & Stouthamer-Loeber, 1998). Recent public health studies that used the Center for Disease Control's Youth Risk Behavior Survey defined violence largely in terms of physical fighting or weapon carrying (Durant, Getts, Cadenhead, & Woods, 1995; Morris, Harrison, Knox, Tromanhauser, Marquis, & Watts, 1995; Valois, McKeown, Garrison, & Vincent, 1995). Researchers who endorse a stricter definition of violence may consider fighting or weapon carrying to be aggressive, but not violent. While fighting and other forms of simple assault may seem less violent than crimes such as rape or murder, studies have indicated that physical fighting is an antecedent behavior for more injurious or fatal types of assault (Elliott, 1994; Loeber et al., 1993). Reduction in levels of physical fighting is thought to be a necessary component of preventing more serious forms of violence (Earls, 1991; Orphinas, Basen-Engquist, Grunbaum, & Parcel, 1995). This study defines violence primarily in terms of physically assaultive behavior, including hitting, fighting, and threatened or actual use of physical force on another person. However, this study's measurement of violence also includes some items that reflect serious violent behaviors, such as robbery and aggravated assault.

Risk Factors for Violent Behavior

Violence is a multiply determined phenomenon that may result from a plethora of factors which include bio-genetic, psychological, and socio-cultural influences (Elliott, 1988; Shamsie, 1985). Indeed, the roots of violence have been investigated from all of these

perspectives. This study will consider selected individual and familial factors related to the development of youth violent behavior; both domains have been recognized as important to consider together when conceptualizing adolescent development (Hauser et al., 1986).

Individual Factors.

Theoretical and empirical literature has underscored the importance of several individual factors in the development of violent and aggressive behaviors, including genetics, neurobiology, problem behaviors, mental disorder, dispositional factors, and social cognition--many of these factors overlap or are linked with one another in various ways. While no individual factor is a sufficient cause of violent behavior, individual characteristics interact with environmental and situational factors to produce a violent event (Reiss & Roth, 1993). The major individual factor examined within the current study is internal controls, defined broadly as cognitive and affective resources that support regulated responses and behaviors. The term "internal" refers to the fact that regulation hinges on reference to internally represented information and occurs within the person, as opposed to regulation through external forces, such as social relationships or societal strictures. "Internal" also implies that mechanisms for self-regulation may be internalized from different external sources.

Scholars have described internal controls in different ways, using terms such as self-control or self-restraint. One common element among different definitions is that it is considered to be a master or "superordinate" construct, one which encompasses other personality traits and functions, and is a major source of individual differences in personality

organization (Gottfredson & Hirschi, 1990; Loevenger, 1976). For example, Weinberger and colleagues conceptualized self-restraint as being comprised of four sub-dimensions of self-control: impulse control, suppression of aggression, consideration of others, and responsibility (Feldman & Weinberger, 1994; Weinberger, 1991). Gottfredson & Hirschi (1990) viewed self-control as directly linked to (if not responsible for) other tendencies, stating that “people who lack self-control tend to be impulsive, insensitive, physical (as opposed to mental), risk-taking, short-sighted, and nonverbal” (p. 90).

Another common element across different descriptions of internal controls is the suppression of impulses in favor of long-term objectives over the immediate gratification of self-focused wants or needs. Gottfredson & Hirschi (1990) described people who have low self-control as responsive to immediate environmental stimuli, favoring a “here and now” orientation over a delayed gratification orientation. Wilson & Herrnstein (1985) note that breakdown in self-restraint often occurs because of failure to anticipate long-term consequences for personal actions, and the placement of value on immediate rather than distant rewards. Similarly, Feldman and Weinberger (1994) saw self-restraint as “tendencies across the lifespan to inhibit immediate, self-focused desires in the interest of promoting long-term goals and positive relations with others” (p. 196).

Internal controls may be considered, in part, a dispositional factor--one which “reflects the individual person’s predispositions, traits, tendencies or styles” (Monahan & Steadman, 1994, p. 19). Personality and temperament are considered dispositional factors. In a study

that found that early childhood measures of temperament predicted violent convictions at age 18, Henry and colleagues (1996) operationalized temperament as lack of control--or “an inability to modulate impulsive expression, impersistence in problem solving, as well as sensitivity to stress and challenge that is expressed in terms of affectively charged negative reactions” (Henry, Caspi, Moffitt, & Silva, 1996, p. 616). Similar to the given definition of internal controls, this definition includes both cognitive and affective regulatory components.

Studies have found violent behavior to be associated with variables that approximate internal controls such as temperament, impulsiveness, and social cognitive difficulties (Farrington, 1989; Henry et al., 1996; Lochman & Dodge, 1994). Studies of internal controls have found a lack of them to be linked to delinquency, criminality, and violent behavior (Cherek, Moeller, Dougherty, & Rhoades, 1997; Feldman & Weinberger, 1994; Lennings, 1991; Polakowski, 1994; Tinklenberg, Steiner, Huckaby, & Tinklenberg, 1996). However, most of these studies have examined this link within delinquent and criminal populations. It is not clear if findings obtained with such samples are generalizable to most adolescents. The current study extended this inquiry within a school based sample of adolescents. Internal controls were defined in a broader fashion than in previous studies, and 3 different aspects of internal controls were examined: ego development, self-restraint, and social cognition.

Ego Development. Different from the psychoanalytic view of the ego, Loevinger (1976) derived the concept of ego development empirically. Difficult to define succinctly, ego development is reflected in a person’s outlook or world view; it is a framework through which

people create meaning or organize their understanding of external events, other persons, and their own internal experiences. It is considered a master trait, which incorporates other personality traits, including elements of impulse control, interpersonal style, conscious concerns, and cognitive complexity (Hauser et al., 1986; Kroger, 1996). Ego development is thought to exist on a continuum of increasing self-integration, differentiation, and cognitive complexity; as individuals advance along this continuum, they are said to move through distinct stages. (Hauser, 1993). Similar to Kohlberg's stages of moral development, individuals may be at "pre-conformist", "conformist", or "post-conformist" levels of ego development (Hauser et al., 1991; Newman, Tellegan, & Bouchard, 1998). Ego development was found to be a more valid index of maturity than chronological age, with higher levels of ego development associated with less outwardly aggressive styles of defense (Levit, 1993).

Although little empirical work exists on the relationship between ego development and violent behavior, theoretical accounts of the relationship have been put forth (Breiner, 1978; Eicke, 1976; Taylor, 1983). Studies have found links between ego development and measures of social functioning, delinquency, and externalizing behaviors (Frank & Quinlan, 1976; Hauser, 1993; Noam et al., 1984). In addition, ego development measured in childhood has predicted aggressive behavior in adulthood (Dubow, Huesmann, & Eron, 1987). However, this study is the first to examine: (1) ego development's relation to violent behavior in adolescence, and (2) ego development as part of a constellation of internal controls.

Self-Restraint. Low self-restraint or impaired impulse control has been recognized as

an important factor associated with certain types of violence and aggression (Barratt, 1994; Earls, 1991). Measures of self-control have distinguished violent from nonviolent offenders (Lennings, 1991). Although it has not been defined uniformly, impulsivity has been described both in terms of motor impulsiveness (physical activity lacking forethought), cognitive impulsiveness (rapid, careless decision making), and nonplanning impulsiveness (lack of concern for the future) (Volavka, 1995). Childhood profiles of violent offenders are often characterized by a constellation of hyperactivity, impulsivity, and inattention (Farrington, 1989, 1991; Hawkins, Herrenkohl, Farrington, Brewer, Catalano, & Harachi, 1998; Loeber, 1990). Low self-restraint has been associated with higher rates of recidivism among violent juveniles (Tinklenberg et al., 1996). It has been suggested that self-restraint and other aspects of self-control may be a good target for intervention with delinquents (Finch, Nelson, & Moss, 1993; Tinklenberg et al., 1996).

Social-Cognition. Studies have documented the presence of social-cognitive difficulties among violent adolescents and several models of social-cognitive processes related to aggression have been developed. An example of such a model is Dodge's social-information processing model for aggression, which states that the violent individual makes errors in (1) perceiving environmental cues; (2) forming expectations of the behavior of others; (3) searching for possible responses; (4) deciding on an appropriate response; and (5) enacting the chosen response (Dodge, 1980, 1986). Social learning experiences and selective recall of hostile cues may lead to a biased expectation that others will respond in a hostile manner (Dodge & Frame,

1982). Among incarcerated male adolescents, hostile attributional biases have been found to relate to reactive aggression, conduct disorders, and violent crimes, but not to nonviolent crimes (Dodge, Price, Bachorowski, & Newman, 1990).

Beliefs about the *value* of aggressive behavior and expectations about one's *ability* (or efficacy) to enact competent behaviors are also important aspects of social cognition that have been linked to violence and/or delinquency. Slaby and Guerra (1988) found that violent adolescents had the most serious social problem-solving deficiencies and held beliefs that were likely to maintain aggressive behavior (e.g. aggression is legitimate and increases self-esteem). Similarly, compared to nonaggressive children, aggressive children reported that it was easy to perform aggressive actions, difficult to inhibit aggressive impulses, and were confident that aggressive actions would both produce tangible rewards and reduce aversive behavior from others (Perry, Perry, & Rasmussen, 1986). Self-efficacy expectations have been related to a range of adaptive behaviors and to a number of adolescent problem behaviors, but this study is the first to examine them in relation to violent behavior specifically (Allen, Leadbeater, & Aber, 1990).

These three constructs represent different aspects of an individual's internal controls. Individuals with strong internal controls will (1) have a sense of their own ability to suppress aggression, inhibit impulses, and behave in controlled manner; (2) possess a higher level of ego development, characterized by psychological insight, recognition of others' perspectives, and greater cognitive complexity in considering interpersonal situations; (3) have a set of

expectations and values that facilitate the successful execution of self-restrained or competent behaviors.

Familial Factors.

Many theories of the development of aggression and violence have implicated the family context as crucial to the origin of violent behavior. Social learning theory holds that aggression develops either from direct modeling of other family members' violent behavior or through family interaction patterns that reward violent behavior (Bandura, 1973; Patterson, DeBaryshe, & Ramsey, 1989). Attachment theory posits that family interactions influence development by influencing the content and organization of the internal models that individuals form of important social relationships (Bowlby, 1969). Although individuals' models of attachment relationships are initially formed with caregivers, these models appear to influence numerous social behaviors beyond the parent-child relationship (Kobak & Sceery, 1988). Expectations of rejection or hostility from others may stem from insecure attachments; these types of expectations have been linked to violence and aggression (Dodge et al., 1990). Finally, family systems theory depicts violent behavior as a response to dissatisfying family interactions, poor discipline practices, or emotional disengagement (Tolan, Cromwell, & Brasswell, 1986).

The family system's impact on problem behavior, delinquency, and aggression has gained a great deal of attention from behavioral scientists. Family system influences can be described in different ways, but three useful subdivisions that were utilized in this study are parental characteristics, parenting practices, and family relationship characteristics (Loeber &

Stouthamer-Loeber, 1986; Pepler & Slaby, 1994). These areas represent distinct elements of family functioning, all of which have been related to adolescent violent behavior, but each implies a slightly different mechanism or process through which the family affects adolescent development. By examining them separately, the differential impact of each type of family factor can be assessed.

Parental Characteristics. Characteristics of parents may affect the behavioral development of children directly, via genetic or social learning influences, or indirectly through how these characteristics affect parenting practices and relationship characteristics. Empirical studies have implicated a number of parental characteristics that may affect the development of violent and aggressive behavior. These include maternal depression (James, 1995), low maternal educational attainment (Kingery, McCoy-Simandale, & Clayton, 1997), low parental interest in education (Farrington, 1991), perceived parental substance use (Saner & Ellickson, 1996), recent suicide attempt or completion (Blum & Rinehart, 1997), and parental history of psychiatric hospitalization for “nerves” (Offord, Boyle, & Racine, 1991).

However, the most frequently cited parental trait associated with youth aggression and violence is parental aggression or antisocial behavior. Farrington (1989, 1991) found that “poor parental behavior”, having a parent convicted of a crime, and fathers’ poor job record predicted violent and nonviolent youth offending. In a clinic-based sample of 122 boys, father-son resemblances in aggressive and antisocial behavior were higher when fathers remained in the family compared to father-absent households (Stewart & deBlois, 1983). In another

psychiatric sample, a spectrum of parental assaultive behaviors significantly predicted the assaultiveness of their latency age children (Pfeffer, Plutchik, & Mizruchi, 1983). McCord (1988) reported that parental aggressiveness gets translated into children's antisocial behavior through two implicit messages: (1) expressive and injurious behaviors are both normal and justified; and (2) egocentrism is acceptable, if not virtuous.

Parental aggressiveness and criminality is likely to reflect a broader lack of self-control or restraint. Indeed, it may be parents' own dearth of internal controls that lead them to behave aggressively within the family system. It has been suggested that parents who lack self-control are not likely to be effective in parenting, nor are they likely to be good teachers or models (Gottfredson & Hirschi, 1990). Fathers' low self-restraint has been associated with a number of adjustment problems in their adolescent sons (D'Angelo, Weinberger, & Feldman, 1995). Given this finding, paired with parent-child similarities in aggression, it is reasonable to suspect that parent internal controls may be related to adolescents' internal controls and violent behavior. Lack of parental internal controls could be transmitted to children in different ways: directly (through genetic or social learning influences), or indirectly through harsh discipline practices or conflictual communication styles. The current study represents an advance beyond previous research by examining the direct and indirect effects of parents internal controls on adolescent violent behavior.

Parenting Practices. Parenting practices have been defined as methods and styles of parenting that entail behaviors aimed at control or socialization, such as discipline and

supervision (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996). Monitoring, reinforcement of coercive behavior, authoritarianism, and harsh physical punishment are all parenting practices that have been associated with adolescents' delinquent, antisocial, and violent behaviors.

In their meta-analytic study of family predictors of juvenile conduct problems, Loeber and Stouthamer-Loeber (1986) found that a dearth of parental monitoring or supervision predicted delinquency and conduct problems. Subsequent reports have been consistent with this conclusion. For example, poor parental supervision was related to later convictions for violent crime (Farrington, 1991). Parents of violent juveniles did less monitoring than parents of nonoffenders (Gorman-Smith et al., 1996). Time spent away from parents has been found to be a strong predictor of violent behavior (Salts, Lindholm, Goddard, & Duncan, 1996). Conversely, parental presence was found to be a protective factor against the participation in violent behaviors for 11th and 12th graders (Blum & Rinehart, 1997). Parental supervision may impact violent behavior directly (as parental presence may act as an external source of adolescent restraint). In addition, it also affords the opportunity for parents to help children develop their own sense of self-control, such that they can avoid problem behaviors on their own (Gottfredson & Hirschi, 1990).

Harsh physical punishment or abusive behavior may result when angry, exasperated parents attempt to discipline children. Several studies have noted a relationship between harsh punishment and youth aggression and violence (Farrington, 1991; Pepler & Slaby, 1994).

Childhood victims of abuse or neglect were more likely than controls to be arrested as juveniles

and adults for violent crimes as well as nontraffic offenses (Maxfield & Widom, 1996). Across a series of 8 retrospective studies, children who suffered greater degrees of abuse had an increased likelihood of being violent or aggressive (James, 1995). Paperny and Deisher (1983) commented that “the association between abuse and violence is fairly clear, i.e., the experience predisposes these youth to use aggression as a means of problem solving, accompanied by a lack of guilt and empathy for other human beings...” (p. 501). This statement suggests that for many children, the experience of physical aggression from parents becomes internalized within their personality in a way which leads them to an increased likelihood of becoming aggressive themselves.

Patterson’s model of delinquency emphasized poor child management practices as central to the origin of serious and chronic delinquency, as they are thought to be the forerunner to coercive cycles of interaction (Patterson et al., 1989, 1991). A result of coercive cycles may be that parents become less involved with and/or more rejecting toward children, both of which have been related to aggressive problem behaviors and delinquency (Gorman-Smith et al., 1996; Pepler & Slaby, 1994). Parenting styles associated with low warmth and high control have been described as "autocratic" or "authoritarian" (Baumrind, 1975). In Farrington’s study of delinquency development, parental authoritarianism predicted violent behavior and was one of the few factors that differentiated between violent and nonviolent offenders (Farrington, 1989, 1991). Parents of children with conduct problems tend to natter and threaten a great deal, but follow through with real consequences less frequently (Capaldi, Chamberlain, &

Patterson, 1997).

All of the ineffective parenting practices reviewed here--lack of supervision, use of physical aggression, and authoritarian overcontrol--have been related to violent behavior in prior research. However, few studies have considered internal controls as a mediating link between ineffective parenting practices and violent behavior.

Relationship Characteristics. A growing body of empirical evidence supports theories of violence that highlight the importance of family relationships. Violent behavior has been linked to a host of family relationship factors including low family cohesion, low maternal pleasure / high exasperation in relation to children, and a lack of positive parental involvement or warmth (Gonzales & Mason, 1991; Gorman-Smith et al., 1996; Haapasalo & Tremblay, 1994; Loeber, 1990; Patterson et al., 1989; Patterson & Stouthamer-Loeber, 1984; Pepler & Slaby, 1994).

One task within the family that is increasingly being recognized as central to social development in adolescence is the need to establish autonomy vis-a-vis parents without sacrificing parental relationships (Allen, Hauser, Eikholt, Bell, & O'Connor, 1994b; Collins, 1990; Hill & Holmbeck, 1986; Moore, 1987; Steinberg, 1990). Particularly in late adolescence, the process of establishing autonomy while attempting to maintain a relationship to parents appears critical to understanding changing patterns of social development that might lead toward or away from aggressive behavior. Teens who can establish their autonomy in reasonable ways may then have the capacity to break out of previous patterns of aggression

and hostility that may have begun in family interactions. Failure to establish autonomy has been related to *increased* levels of hostility over time (Allen, Hauser, O'Connor, Bell, & Eickholt, 1996). This study examined parents' and teens' tendencies to promote and inhibit autonomy and relatedness within family interactions. Family verbal interactions may serve to reinforce and magnify children's problem solving styles, such that aggressive children become increasingly aggressive (Dadds, Barret, Rapee, & Ryan, 1996). Coercive interaction patterns that have been linked to the development of antisocial behavior maybe characterized by aversive behaviors which undermine autonomy and relatedness within a dyad.

A crucial element of the development of coercive cycles of interaction occurs when parents efforts at disciplining children result in the reinforcement of children's noxious and coercive behaviors (Patterson, Reid, & Dishion, 1992). Children learn that if they persist in aggressive, escalatory behaviors, parents will give in to their wishes; furthermore, conflictual, coercive exchanges increase in intensity over time, such that they become more coercive, painful, and violent and efforts at redirecting aggression become more difficult (Morton, 1987; Snyder, Schrepferman, & St. Peter, 1997). Given this work on coercive behaviors, it is reasonable to hypothesize that violent adolescents will have highly conflictual relationships with parents, with coercive interactions characterized by low promotion and high inhibition of autonomy and relatedness. This study is the first to explore this hypothesis.

Although some studies have examined relations between family characteristics and teen violence, researchers have typically relied upon self-reports about qualities of family life, have

failed to examine predictors of change, and have not considered how the impact of family interactions might be mediated by developmental processes within the adolescent. The current study represents one of the first *observational* studies to relate changing patterns of interaction between adolescents and their parents in mid- to late-adolescence to changing levels of violence and aggression (Collins, 1990).

The Conceptual Model

Figure 1 depicts the conceptual model used in this study to explore the relationship between parent internal controls, ineffective parenting practices, conflictual relationship characteristics, adolescent internal controls, and violent behavior. This model is derived from 2 different conceptualizations. The first is Gottfredson and Hirschi's (1990) assertion that criminal behavior results largely from an individual's lack of self-control, which develops as a result of ineffective parenting; ineffective parenting may be a byproduct of low self-control in parents. The second is the idea that self-restraint mediates the link between parenting practices/family relationships and developmental outcomes among adolescents. This relationship has been demonstrated in studies of adolescent sexual behavior (Feldman & Brown, 1993), delinquency (Feldman & Weinberger, 1994), motivation to achieve in school (Wentzel & Feldman, 1993), academic performance (Wentzel, Feldman, & Weinberger, 1991), and peer relations (Feldman & Wentzel, 1990), but has not been examined with regard to adolescent violent behavior. It is postulated that parents' lack of internal controls may have direct and indirect effects on adolescent violent behavior. It is also hypothesized that parents' and families' role in facilitating

adolescents' development of self-regulatory skills may be a central mechanism through which parents' influence the development of violent behavior.

Given that many explanatory models were possible, different models were tested in accordance with the conceptual model. Adolescent internal controls were thought to be most proximal to violent behavior, and therefore were considered first, followed by relationship characteristics, parenting practices, and parental internal controls. This project was focused particularly on examining intervening linkages between parent characteristics and violent behavior. Admittedly, the analytic strategy was based upon a "parent-driven" model. Although other models are certainly possible (with directions of effects conceptualized slightly differently), conducting analyses in accordance with this model provided an organized framework within which to approach the complexities of the relationships between the variables. This study joins other recent investigations that have attempted to discern the impact of familial processes on the development of aggressive or antisocial behavior, in part via their effects on relevant individual-level factors (Dadds et al., 1996; Snyder et al., 1997).

Research Questions

The central assumption of this study is that understanding changes in adolescent violent behavior will strengthen prevention and intervention efforts to reduce the incidence of adolescent violence and aggression. Efforts to prevent violent behavior must seek both to target youth at elevated risk for violent behavior and to select the most appropriate interventions. To further these efforts, two major research questions are addressed in this

study:

The Question of Longitudinal Prediction.

Based on information gathered during mid adolescence (Time 1), what factors predict violent behavior in late adolescence (Time 2)?

1. Do adolescent internal controls at Time 1 predict violent behavior at Time 2? (See Figure 2, pathway 1). 2. Do ineffective parenting practices and conflictual relationship characteristics predict Time 2 violent behavior? (See Figure 2, pathway 2). 3. Do parent internal controls at Time 1 predict violent behavior at Time 2? (See Figure 2, pathway 3). 4. If ineffective parenting practices are related to violent behavior, then the question of whether adolescent internal controls act as a mediator or a moderator between ineffective parenting practices and violent behavior will be explored (see Figure 3). 5. If conflictual relationship characteristics are related to violent behavior, then the question of whether individual internal controls act as a mediator or a moderator between relationship characteristics and violent behavior will be examined (see Figure 3). 6. If parents' internal controls are related to violent behavior, then the possibility that adolescent internal controls, parenting practices, or relationship characteristics act as mediators or moderators between parental characteristics and violent behavior will be tested (see Figure 4).

The Question of Change.

What processes are central to producing *increases or decreases* in violent behavior between Time 1 and Time 2? This question is addressed more specifically through the following

questions: 1. Do adolescent internal controls predict changes in violent behavior over time? (See Figure 5, pathway 1). 2. Do parenting practices and relationship characteristics predict change in violent behavior? (See Figure 5, pathway 2). 3. Do parent internal controls predict changes in violent behavior over time? (See Figure 5, pathway 3). 4. If parenting practices are related to violent behavior, then the question of whether adolescent internal controls act as a mediator or a moderator between parenting practices and changes in violent behavior will be explored (See Figure 6). 5. If relationship characteristics are related to violent behavior, then the question of whether individual internal controls act as a mediator or a moderator between relationship characteristics and changes in violent behavior will be examined (see Figure 6). 6. If parents' internal controls are related to violent behavior, then the possibility that adolescent internal controls, parenting practices, or relationship characteristics act as mediators or moderators between parental characteristics and changes in violent behavior will be tested (see Figure 7).

The current investigation represents an improvement over prior studies in at least two ways. First, this study provides a more in-depth assessment of both familial and individual domains than previous studies: the measurement strategy includes projective, objective, and observational methods, and multiple measures using parents, peers, and youth as informants. Second, this study explores the mechanisms through which familial and individual factors influence one another. While some studies of violent behavior have included both familial and individual components, the impact of these factors vis-vis one another is rarely considered, and

not well understood (National Academy of Sciences, 1997; Reiss & Roth, 1993).

Method

Sample

This study utilized data from the Virginia Study of Teens and Families (VSTF), a longitudinal study of 150 ninth and tenth graders living in central Virginia. Of the participants who completed all aspects of the first wave of this study, 138 adolescents and their families completed the second wave of data collection¹. The teens were originally recruited through two local, public high schools located in a geographic area characterized as both rural and suburban. Adolescents were eligible for selection based on the presence of at least one of four academic risk factors including multiple absences, a single failing grade, a single suspension, and any history of grade retention. These criteria target the population of adolescents described as the "forgotten half" of high school students who are not likely to go onto college and who are at heightened risk for problem behaviors in adolescence (William T. Grant Commission, 1988). Indeed, approximately half of the schools' students met selection criteria and were eligible to participate in this study.

Within the current sample ($N=138$), the median annual family income was \$25,000,

¹Adolescents were considered to have participated in the second wave of data collection if they had complete data from at least two of three informants about adolescent violent behavior (parents, peers, and adolescents).

ranging from \$2,500 to more than \$75,000. There were nearly equal numbers of male and female adolescents (51% male). During the first wave of the study, adolescents ranged in age from 14 to 18.75 years, with an average age of 15.9 years ($SD = .81$). Follow-up interviews were spaced for each subject so as to occur approximately 2 years after the initial data collection. The racial/ethnic background of the sample was 59.4% Caucasian and 38.6% African-American; 2% of the sample self-identified as "other" (e.g. Native-American, multi-racial). There was diversity in the sample with respect to family structure, with 55.1% of adolescents in single parent families, 27.5% in intact families, and 17.4% in step-families. The modal level of parental education was "some college or technical training beyond high school", but less than a graduate degree; education level ranged from less than eighth grade to completion of a graduate degree.

In order to examine whether the 138 study participants differed from the 12 individuals who were dropped from the study due to incomplete or missing data, chi-square and t-test analyses were conducted. Of 42 study or demographic variables, mean differences ($p < .05$) were detected in 5 measures. Compared to the nonparticipants, participating adolescents had: greater mean parent-reported violence at Time 1 ($t = -2.10$, $p < .05$); higher levels of adolescent and maternal self-restraint ($t = -2.30$, $p < .05$ and $t = -2.30$, $p < .05$, respectively); lower levels of mother-reported conflict ($t = 1.97$, $p = .05$); and lower levels of paternal psychological control, as reported by teens ($t = 2.61$, $p < .05$).

Procedure

Families of adolescents identified as meeting the selection criteria were contacted first by mail and later followed up with phone calls. Approximately 67% of families contacted agreed to participate. At the start of each of the two 3-hour sessions at the University of Virginia, the interviewer described the purpose of the study and obtained active, informed consent from all family members. Face-to-face interviews and a large battery of questionnaires were administered individually in separate rooms. Family members also participated in videotaped dyadic interaction tasks. Measures examined a variety of adolescent behaviors (e.g., sexual activity, delinquency and substance use, self-esteem and social competence) as well as assessed the quality of their family and peer relationships. Issues of confidentiality were emphasized repeatedly throughout both sessions especially with the target adolescent. A list of referral agencies was given to each family at the end of the sessions in case a family member wished to seek the services of qualified professionals for any concerns that may have arisen during the course of the interviews. All families were paid a total of \$105. Transportation and child care were also provided if requested.

Approximately 2 years subsequent to first wave interviews, adolescents and their families were re-contacted and scheduled for two 3-hour sessions at the University of Virginia. Adolescents attended both sessions; parents attended the first session only. Procedures at these follow-up sessions were identical to the original procedures, with the exception of payment: adolescents and parents were paid \$65 and \$50, respectively.

Peer Sample

At both waves of data collection, adolescents were asked to list the names and phone numbers of five friends whom they felt knew them well, and whom they would feel comfortable having participate in the study. Researchers explained that peers would fill out measures to describe themselves and the target adolescent, and that information supplied by themselves and peers would be kept confidential. Researchers also emphasized to teens that they did not have to supply names of friends if they did not feel comfortable doing so. Once adolescents had given consent for their friends to be contacted, two peers of each adolescent were selected randomly and contacted by telephone. After the study was explained, peers who were interested in participating were scheduled to attend a 60-minute interview session at the University of Virginia, during which they completed measures about the adolescent and about themselves. Parental consent was required to participate for peers under 18 years old. Participants were instructed that all information was kept completely confidential. Transportation for the peers was provided if necessary and each peer was paid for participating.

During the first wave of data collection, 203 peers participated in the study (mean age=16.29, SD=1.4; 52.5% female; 60% white). Of the 138 target adolescents in the sample, 85 had two peers provide information, 35 had one peer that participated, and 18 had no peer-reported information at Time 1. Peers reported that they had known the targeted teens an average of 4.9 years (SD= 3.28, range= 0-17 years).

At the follow-up wave of data collection, 207 peers participated (mean age=17.9,

$SD=1.8$; 53% female; 58% white). Of the 138 target adolescents, 82 had two peers provide information, 43 had one peer that participated, and 13 had no peer-reported information. At Time 2, peers reported that they had known the teens in the study an average of 5.5 years ($SD= 4.3$, range= 0.8-18.8 years). In addition, 57% of the peers believed they knew the target adolescent "very well"; 38% described themselves as the target adolescent's best friend.

Measurement

The primary measurement strategy involved the use of multiple assessment methods from multiple sources for each of the constructs of interest. This approach reduces reporting biases from any single source, and yields truly independent assessments of the relations among critical constructs, thus adding to the validity of the study.

Internal Controls.

Ego Development. Adolescents and their parents completed the Washington University Sentence Completion Test (SCT), a projective measure used to assess an individual's level of ego development (see Appendix A). Developed by Loevinger and colleagues (Loevinger & Wessler, 1970), the test consists of 36 unfinished sentence stems to be completed by the subject. Stem responses were coded by trained raters who assigned each response one of nine levels of development by matching the response to a category provided by the scoring manuals. An individual's level of ego development was determined by summing the ratings to all 36 stems. Males and females completed slightly different protocols, and separate manuals were used for scoring. Spearman-Brown correlations indicated high reliability

between coders ($r=.98$). Internal consistency among items was calculated using Cronbach's Alpha: $\alpha=.90$ for females, $\alpha=.85$ for males. Studies of the SCT's construct validity as a measure of ego development have found that SCT scores have been related to measures of moral development (Lieberman, Gaa, & Frankiewicz, 1983), impulsiveness (Kishton, Starett, & Lucas, 1984), as well as interpersonal and cognitive styles (Lorr & Manning, 1978). In addition, the SCT has demonstrated discriminant validity from other constructs such as intelligence and verbal fluency (Hauser, 1976).

Self-Restraint. Adolescents and their parents also completed the Weinberger Adjustment Inventory, a self-report measure that examines two dimensions of socio-emotional adjustment: distress and self-restraint (WAI; Weinberger, 1989). A copy of the measure can be found in Appendix B. In this study, only the self-restraint scale was utilized. The self-restraint scale, which examines undercontrolled behavior and beliefs that support undercontrolled behavior, is comprised of four subscales: 1) suppression of aggression (e.g. "People who get me angry better watch out."); 2) impulse control (e.g. "I become wild and crazy and do things that other people might not like."); 3) consideration of others (e.g. "Before I do something, I think about how it will affect the people around me."); 4) responsibility (e.g. "I do things that I know really aren't right."). Adolescents respond to statements using a 5-point Likert scale (1=almost never true, 5=almost always true). The restraint scale has demonstrated both convergent and discriminant validity in a multimethod assessment (Weinberger, Tublin, Ford, & Feldman, 1990). This measure demonstrated adequate internal consistency

(Cronbach's $\alpha = .84, .83,$ and $.74$ for youth, mothers and fathers, respectively).

Social Cognition (Competence Expectations). The Adolescent Problem Inventory (API) for boys (Freedman, Rosenthal, Donohoe, Schlundt, & McFall, 1978) and the Problem Inventory for Adolescent Girls (Gaffney & McFall, 1981) were used to elicit adolescents' expectations and values toward socially competent behaviors (see Appendix C). Teens responded to nine hypothetical social dilemmas followed by a competent solution described as "another teenager's response". Using an anchored 10-point scale, adolescents then responded to a series of probes about their own values (i.e. how much would the teen like someone who performed such a response), the values of an important adult (how much would the adult like someone who performed such a response), and their self-efficacy expectations (could the teen perform the given response if he/she tried). A score for identification with the positive values of an adult was derived by subtracting the perceived adult value score from the adolescent value score on each item. The resulting score indicates the extent to which the youth's values are similar to those of an important adult. An overall composite score for competence expectations was created by combining scores obtained for self-efficacy expectations and for identification with adult values ($r = .46, p < .001$) (Allen et al., 1990).

Parenting Practices

Psychological Control. Psychological (over)control was measured by a 10-item scale from the Child Report of Parenting Behavior Inventory (CRPBI). The CRPBI was originally developed by Schaefer (1965), was later revised as the CRPBI-108 by Schluderman and

Schluderman (1970), and revised a second time in 1988 as the CRPBI-30. The current study uses the CRPBI-30 (see Appendix D), the factors from which have been found to be reliable with the longer version. This psychological control vs. psychological autonomy scale assessed the degree to which adolescents viewed their parents as using emotionally manipulative control strategies (i.e. guilt, love withdrawal). Youth completed separate forms for each parent. In addition, parents completed a self-report version of the measure. This scale has been found to possess good test-retest reliability, as well as to be associated with several aspects of family functioning and adolescent outcomes (Collins, 1990; Schaefer, 1965; Steinberg, Dornbusch & Brown, 1992). Internal consistency was good (Cronbach's $\alpha = .81$).

Physical Aggression. Parents' use of physical aggression toward their children was measured by the Conflict Tactics Scale (CTS; Straus, 1979). This well known measure of family violence was completed by both adolescents and parents, who were asked to report the frequency with which parents and adolescents engaged in different behaviors with each other during conflicts. This study used the original 11-item CTS physical aggression scale, with three modifications (see Appendix E). First, respondents were asked to report the frequency of physically aggressive behaviors that they experienced or demonstrated *across their lifetime*, as opposed to over the original timeframe of the past year. Second, instead of reporting raw frequencies, a 4-point scale (1=never, 2=once/twice, 3=several times, 4=many times) was used to estimate the general frequency with which these behaviors occurred. Third, the final scores were obtained by weighting the frequency of each physically aggressive behavior by the

seriousness of the behavior, and summing across behaviors. This technique has been used in a previous study and assumes that some behaviors (e.g. being threatened with a gun or intentionally burned) are more aggressive and traumatic than others and should be quantified as such (Davis, 1996).

The physical aggression subscale of the CTS has shown both internal consistency and construct validity in several studies (Straus, 1988). In the current study, the physical aggression subscales were internally consistent for both teen reports ($\alpha=.68$ for mothers, $\alpha=.79$ for fathers) and parent reports ($\alpha=.56$ for mothers, $\alpha=.66$ for fathers) of parental aggression.

Monitoring. Parental monitoring was measured by a modified version of the Assessment of Monitoring and Control questionnaire developed by Hetherington and Clingempeel (1992), originally derived directly from the dimension of parental authority-directiveness within Baumrind's (1979) parental behavioral Q-sort. The measure uses a 5-point rating scale to assess the parents' knowledge of, attempted control, and actual control over different aspects of their teens' lives (see Appendix F). Both parents and adolescents reported how often (from "never" to "always") parents knew about their adolescents' activities, interests, choice of friends, and problem behaviors. The total score is derived from summing scores from 13 items. Within this sample, the measure demonstrated high internal consistency for both the youth version ($\alpha=.89$ for mothers, $\alpha=.92$ for fathers) and the parents' version ($\alpha=.81$ for mothers, $\alpha=.83$ for fathers).

Relationship Characteristics

Parent-Adolescent Conflict. Adolescents and their parents completed a measure of parent-child conflict (PCC; Hetherington & Clingempeel, 1992). Adolescents completed separate forms for each parent. A copy of this measure appears in Appendix G. The scale to be included in this study assessed the frequency of adolescent-parent conflict about 39 different issues. Participants rated conflict frequency in the past month on a 7-point scale from "never" to "more than once a day". The measure showed strong internal consistency for both adolescent reports ($\alpha=.91$ for mothers, $\alpha=.96$ for fathers) and parent reports ($\alpha=.91$ for mothers, $\alpha=.92$ for fathers).

Autonomy and Relatedness. Adolescents and their parents participated in a revealed differences task in which each dyad (mother-adolescent, father-adolescent, mother-father) discussed a family issue about which they disagreed. Videotaped family interactions were coded using a reliable and valid coding system which examines behaviors promoting or inhibiting autonomy and relatedness in the dyad (Allen, Hauser, Bell, Boykin, & Tate, 1995). Individual speeches, which were evaluated in terms of function, frequency, and intensity, were summed to produce scores on 10 different codes that were classified into 2 major scales: promoting autonomous-relatedness and undermining autonomous-relatedness. The promoting autonomous-relatedness scale was comprised of behaviors that promote autonomy (stating reasons and exhibiting confidence) and behaviors that promote relatedness (making validating remarks, asking questions, showing signs of active, engaged listening). The undermining autonomous-relatedness scale consisted of behaviors that undermine autonomy

(overpersonalizing, pressuring, and/or recanting one's own position) and behaviors that undermine relatedness (making rude, hostile, or critical remarks and demonstrating distracting or ignoring behaviors). Scores for parents and adolescents were used as separate indicators of parent-adolescent relationship functioning. Interrater reliability among coders was calculated using Spearman-Brown correlations. Reliability coefficients for the promoting autonomous-relatedness scale ranged from .82 to .92. For undermining autonomous-relatedness, reliability coefficients ranged from .69 to .88. Internal consistency coefficients (Cronbach's alpha) ranged from .57 to .76 for the undermining autonomous-relatedness scale, and from .70 to .81 for the promoting autonomous-relatedness scale. The construct validity and psychometric properties of the major scales have been illustrated in several studies of adolescent psychosocial adjustment (Allen, Hauser, Bell, & O'Connor, 1994a; Allen et al., 1994b).

Adolescent Violent Behavior

Self reports. Elliott's measure of Self-Reported Delinquency--a previously normed, well-validated, and highly used self-report measure of adolescent criminal violence and aggression--was employed (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983). This measure appears in Appendix H. Adolescents were asked to report the frequency with which they participated in certain violent behaviors in the past six months (e.g. "how many times have you been involved in gang fights?"). Six items were summed to create a total score for frequency of violent crimes against persons (Cronbach's $\alpha=.59$). When carefully obtained, self-reports of problem behaviors such as violence and aggression have been found: a) to correlate

significantly with reports obtained from independent observers and official records; b) to be highly reliable; and, c) to eliminate systematic biases in official records of deviant behavior (Elliott & Ageton, 1980; Farrington, 1973; Patterson & Stouthamer-Loeber, 1984).

Peer reports. In addition, peer reports of adolescents' violent behavior were obtained using an adapted version of the Adolescent Self-Perception Profile (Harter, 1988), which asked about occurrence of specific types of violent acts by the adolescent in the study (see Appendix I). Using a 4-point scale, peers were asked to describe how characteristic of the target adolescent were assaultive and fighting behaviors. An average score was computed using reports from both peers. Peer ratings were expected to be related to one another, but not perfectly, as it would be anticipated that different peers would be familiar with the target adolescent in different ways. Agreement between peers was calculated using Spearman-Brown's r ($r=.60$ at Time 1, $r=.31$ at Time 2). This measure showed adequate levels of internal consistency (Cronbach's $\alpha = .67$ at Time 1, $\alpha = .56$ at Time 2). These measures have been found to correlate substantially with adolescent and parent reports, but also to show somewhat different and stronger relations to other indices of adolescents' functioning than do self-report measures.

Parent reports. Parents reported about their adolescents' violent behaviors using the Child Behavior Checklist (CBCL; Achenbach, 1991; Achenbach & Edelbrock, 1983). This measure has been widely used in research and clinical applications with samples of normal and clinically-referred youths, and has shown good evidence of reliability and validity (Achenbach & Edelbrock, 1983). A copy of this measure is available in Appendix J.

Presented with a list of 120 behaviors or characteristics, parents rated each characteristic as "not true", "somewhat or sometimes true" or "very or often true" for the target adolescent. If both parents completed this measure, their scores were combined to yield a single index of violent behavior. Agreement between parents was derived using a Spearman-Brown coefficient ($r=.43$ at Time 1, $r=.08$ at Time 2). A violence subscale was derived by summing 2 items: "gets in fights" and "physically attacks people". These items are similar in content to the items in the peer-report measure. However, the internal consistency of this 2-item scale was low (Cronbach's $\alpha=.49$ at Time 1, $\alpha=.16$ at Time 2).

Composite Measures

Composite measures of each major construct (i.e. parenting practices, parent-adolescent relationship characteristics, internal controls, and adolescent violent behavior) were created on *a priori* theoretical and empirical grounds, and informed by the use of factor analysis. All variables were standardized ($M=0$, $SD=1$) before being entered into a composite.

For adolescents, the internal controls composite was constructed by summing scores for ego development, competence expectations, and self-restraint. If fewer than 2 of these 3 indicators were present, the composite measure was considered missing for that individual. For parents, the internal controls composite was constructed by summing scores for ego development and self-restraint only, as no data about parents' competence expectations were collected. Higher scores on the internal controls composite indicate higher levels of internal controls.

The parenting practices composite was created by summing both parent and adolescent reports of parents' psychological control, physical aggression, and monitoring. If a participant had less than 5 of these 6 indicators present, the composite measure was considered missing for that individual. Before compositing, scores for parent and teen reports of monitoring were reverse coded, such that all measures of parenting practices were being measured in the same direction (i.e. lower scores indicating more effective parenting practices, higher scores indicating more ineffective parenting practices).

Similarly, the relationship characteristics composite was created by summing parent and adolescent reports total conflict frequency, and scores for parents' and adolescents' promoting and undermining autonomous-relatedness. Again, if less than 5 of these 6 indicators were present, the composite measure was considered missing for that individual. Before compositing, scores for parent and teen promoting autonomous-relatedness were reverse coded, such that all measures of relationship characteristics were being measured in the same direction (i.e. lower scores indicating better parent-teen relations, higher scores indicating more coercive, conflictual relations).

Finally, the violent behavior composite was constructed by summing scores from 3 measures of violent behavior: self-, peer and parent reports. Participants received a composite score only if 2 of these 3 measures were available. In addition, a serious violent behavior composite was constructed. This measure used the 3 most violent self-report items (attacking someone with the idea of seriously hurting or killing them, participating in gang fights, and using

force or strong arm tactics to obtain money or goods from others) and the most violent peer-reported item (physically assaulting others, like jumping or mugging them). Higher scores on these composites indicated higher levels of violent behavior.

The strategy of constructing multi-measure, multi-reporter composite variables turns the possible disadvantage of using a large number of measures into an asset, by creating strong measures of key concepts while keeping the total number of hypotheses tested within reasonable limits.

Analysis Strategy

Analyses for the stated research questions used several complementary approaches to achieve the common objective of understanding how certain individual or combinations of risk factors influence the evolution of adolescent violent and aggressive behavior. The data analytic strategy was **not** meant to test more complex models that would require LISREL techniques for two reasons: (1) statistical power limitations due to the sample size; and (2) not enough is known about the “simple” relationships between the constructs examined. Rather, the goal was to construct and test smaller models that could act as building blocks towards the development of more comprehensive models.

First, measures were combined in theoretically and psychometrically sound ways to yield the most valid possible summary assessment of each examined construct. Also at this phase of analyses, frequency data and other descriptive statistics were used to calculate the proportion of adolescents in the sample who exhibited violent behavior. In addition, basic

descriptive statistics (i.e., means, standard deviations, ranges) about all variables of interest were computed.

Next, correlational analyses were used to derive a general picture of how the variables in this study relate to one another. Different sets of regression analyses were employed to do the following:

(1) Assess the direct effects of familial factors and adolescent internal controls on violent behavior (Figure 2, pathways labeled 1, 2, and 3).

(2) Assess the indirect effects or whether certain variables mediate the relationship between other variables of interest and violent behavior. The common method for testing mediational models was summarized succinctly by Boivin and Hymel (1997):

According to Baron and Kenny (1986), mediation is established only if a series of conditions can be met. The first two conditions require a demonstration in separate regression equations that the independent variables affect both the dependent variable (first condition) and the mediator (second condition). Then, the mediator must be shown to affect the dependent variable after the specific effect of the independent variable on the dependent variable is taken into account (third condition). Once these conditions are met, a comparison is made between the first and third regression equations to determine whether the effect of the independent variable on the dependent variable is reduced when the effect of the mediator on the dependent variable is accounted for (fourth condition). If so, empirical support for mediation is provided

(Boivin & Hymel, 1997, p. 138).

For example, to test whether adolescent internal controls mediate the relationship between parenting practices and violent behavior the following conditions would have to be met: (a) parenting practices must be shown to affect violent behavior; (b) parenting practices must be shown to affect adolescent internal controls; (c) adolescent internal controls must be shown to affect violent behavior after accounting for the effect of parenting practices on violent behavior; (d) the regression coefficient for parenting practices in "(a)" show a substantial reduction in "(c)".

(3) Assess possible moderating effects of certain variables, or whether certain variables are related to violent behavior only under certain conditions (i.e. at higher or lower levels of another variable). This was accomplished by creating multiplicative interaction terms that were entered last into hierarchical regression models. An example of a moderating hypothesis with respect to these data would be that poor parenting practices are related to increased levels of violent behavior only for teens who have low levels of internal controls.

(4) Predict change in levels of violence from age 16 to age 18 from the individual and family factors described above. These analyses used hierarchical regressions to predict the composite measure of violence at 18 after first having entered violence at 16 (i.e. accounting for stability), followed by risk factors of interest.

(5) Consider possible demographic interaction effects, in which patterns of relationships observed above might differ for different groups of adolescents (e.g., males vs. females, ethnic

minority vs. nonminority status).

Results

Preliminary Analyses

Before conducting major analyses aimed at addressing the study's primary research questions, preliminary analyses were conducted to (1) screen the data for data entry errors, outliers, and non-normally distributed variables; (2) assess the nature of violent behavior and changes over time in violent behavior in the sample; and (3) examine correlations among variables of interest.

Data Screening

Screening data for data entry errors was completed by inspecting the minimum values, maximum values, means, and standard deviations for plausibility. These descriptive statistics are presented in Table 2. Box plots of each variable were used to detect the presence of extreme values or outliers. A data point was considered an outlier if it exceeded 3 standard deviations from the sample mean of the variable in question. Outliers were detected in the measure of self-reported violence, in the maternal parenting practices composite, in the Time 1 violent behavior composite, and in the Time 1 and Time 2 serious violent behavior composites.

Insert Table 2 here

Two strategies were used to handle extreme data points. First, individual or composite variables were transformed in cases where outliers were present and the distribution of the variable was skewed. The type of transformation used was based on the shape of the distribution and the degree of skewness: a square-root transformation was used for less skewed variable distributions; an inverse transformation was used for highly skewed distributions (Tabachnick & Fidell, 1989). The second approach to handling outliers was to trim extreme values to within 3 standard deviations of the mean. This procedure was used for variables that had a basically normal distribution with the exception a small number of extreme scores.

Violent Behavior and Changes in Violent Behavior

To determine the amount of violent behavior reported in the sample, frequency distributions of each of the violence indicators were inspected. Based on these distributions, the percentage of adolescents who displayed *at least some* violent behavior at Time 1 and Time 2 was calculated. Table 3 contains the percentage of self-reported violent activities in the sample at Time 1 and Time 2; Table 4 contains peer reports of fighting and physically assaultive behaviors at Time 1 and Time 2; Table 5 displays parent reports of fighting behavior and physically attacking others.

Insert Tables 3-5 here

Within self-reports of violent behavior, the most frequently reported activity is hitting/threatening to hit others (most likely peers or siblings). Other forms of violent behavior were reported with

considerably lower frequency. At Time 1, the overall frequency of peer- and self-reported violent behaviors were the same (62%). However, at Time 2 there was a greater disparity between self-reports (39% reporting some violent activity) and peer-reports (65% reporting some violent activity in the target adolescent). Peers reported that adolescents were engaging in levels of violent behavior comparable to what target teens and peers were reporting at Time 1; target adolescents reported that they were engaging in less violent behavior at Time 2. Parents reported lower levels of violent behavior relative to the target adolescents and peers (e.g. parents reported 21% of the adolescents engaged in fighting behavior, both at Time 1 and Time 2).

Stability and change in violent behavior over time was assessed using three approaches. First, correlation coefficients between Time 1 and Time 2 measures of violent behavior were calculated. Correlational analyses comparing Time 1 indicators of violence to the same indicators at Time 2 showed moderate stability across all indicators (see Table 6).

Second, difference scores were created for each reporter by subtracting Time 1 violent behavior from Time 2 violent behavior; these difference scores were tested subsequently (using within-subjects t-tests) to examine if the difference score means were different significantly from zero. These results are presented in Table 7. Self-reports levels of violent behavior were found to decrease between Time 1 and Time 2 ($t=-5.18$, $p<.001$). No changes in levels of peer or parent reported violent behavior were found.

Finally, these difference scores were examined to determine the percentage of adolescents whose violent behavior showed any indication of increase or decrease; it is important to note that

these changes were not necessarily statistically significant changes. Table 8 summarizes these results. Whether adolescents changed in violent behavior over time often varied according to the reporter: the majority of peers reported increases in violent behavior; most target adolescents reported decreases in their own violent behavior; and most parents reported the same amount violent behavior at Time 1 and Time 2.

Insert Tables 6-8 here

To summarize, a sizable percentage of the sample engaged in at least some violent behaviors. Parents tended to report lower levels of violence than did target adolescents or peers. Significant stability between levels of violent behavior at Time 1 and Time 2 was evident, as measured by reports from parents, peers, and target adolescents. Self-reported violent behavior decreased significantly over time. The magnitude and direction of change in violent behavior differed somewhat across reporters.

Correlational Analyses

Preliminary correlational analyses were conducted to examine the relationships of variables to one another, among both major construct composites and the variables which comprise them. Table 9 and Table 10 display correlations between the variables that make up the parent internal controls, parenting practices, and parent-teen relationship characteristics composites for mothers and fathers, respectively.

Insert Tables 9-10 here

Measures of parents' internal controls--self-restraint and ego development--were significantly associated ($r=.37$, $p<.001$ for mothers; $r=.34$, $p<.05$ for fathers). Measures of ineffective parenting practices were also related. For example, parents' self-reported use of psychological control was related to both parents' and adolescents' reports of parental physical aggression. Within measures of parent-teen relationship characteristics, parents and teens use of discourse that promoted autonomous-relatedness was moderately associated ($r=.58$, $p<.001$ for mother-adolescent dyads; $r=.72$, $p<.001$ for father-adolescent dyads). The same was true for behaviors that inhibited autonomous-relatedness ($r=.41$, $p<.001$ for mother-adolescent dyads; $r=.67$, $p<.01$ for father-adolescent dyads). Mother-teen dyads with higher conflict frequency demonstrated fewer behaviors which promoted autonomous-relatedness. Conflict frequency was also related to parenting practices: greater conflict was associated with parents' use of psychological control and physical aggression. In addition, parents with higher levels of self-restraint and ego development had teens that showed more behaviors promoting autonomous-relatedness.

Table 11 and Table 12 show correlations between the parent/family measures (variables that comprise parent internal controls, parenting practices, and parent-teen relationship characteristics) and adolescent variables (measures of internal controls and violent behavior) for mothers and fathers, respectively.

Insert Tables 11-12 here

Parent internal controls were related to adolescent internal controls and violent behavior, but the pattern of association was different for mothers and fathers. Maternal self-restraint and ego development were both related positively to adolescent ego development, but were not associated significantly with any other indicators of adolescent internal controls. Surprisingly, paternal self-restraint was associated with *lower* adolescent competence expectations. Maternal self-restraint was linked to lower levels of violent behavior across all reporters; fathers' self-restraint, however, was not significantly associated with any of the violent behavior indicators. Mothers' ego development was related to lower levels of peer-reported violent behavior, whereas fathers' ego development was related to lower levels of parent reported violent behavior.

Parenting practices were linked to adolescent internal controls, particularly for mothers. Relatively few measures of parenting practices were related to violent behavior. Adolescent reports of maternal monitoring were linked to all indicators of adolescent internal controls. Mothers' and teens' reports of maternal aggression were associated with lower levels of teen self-restraint and ego development, respectively. Adolescents' reports of maternal psychological control were correlated negatively with all three measures of adolescent internal controls; teens' reports of greater paternal psychological control were associated with lower adolescent self-restraint and competence expectations. Adolescent reports of parents psychological control were

also related to self- and peer-reported violent behavior.

Several links between parent-adolescent relationship characteristics and adolescent internal controls and violent behaviors were evident. Higher mother-teen conflict frequency was associated with lower levels of ego development and self-restraint. Promoting autonomous-relatedness, as observed in parents and teens, was associated with higher levels of adolescent ego development. Adolescents' behaviors inhibiting autonomous-relatedness was correlated negatively with adolescent ego development and self-restraint. Adolescent-reported conflict frequency with both parents was related to parent-reported violent behavior. Finally, promoting autonomous-relatedness, especially in father-teen dyads, was inversely related to peer reported violent behavior.

In Table 13, correlation coefficients among measures of adolescent internal controls and violent behaviors are presented. All measures of adolescent internal controls are correlated significantly with one another. Of the measures of adolescent violent behavior, only two--self and peer reports--were significantly associated. Parent reports of violent behavior did not conform to peer or self-reported measures. Similarly, while greater peer- and self-reported violent behavior was linked to lower levels of adolescent ego development, self-restraint, and competence expectations, parent reports of violent behavior were associated only with adolescent ego development.

Insert Table 13 here

Correlations among the major construct composites for mother-teen dyads and father-teen dyads are presented in Tables 14 and 15, respectively. For mother-adolescent dyads, all of the major construct composites were significantly related to one another; the only exceptions were the relationship of adolescent serious violence to mother internal controls and ineffective parenting practices, which were significant at the trend ($p < .10$) level. For father-adolescent dyads, ineffective parenting practices and coercive relationship characteristics were associated with reduced internal controls. Adolescent violent and serious violent behaviors were positively associated with ineffective parenting practices and inversely related to adolescent internal controls.

Insert Tables 14-15 here

Demographic Effects.

Demographic characteristics, such as gender, minority status, socioeconomic status, and family structure, have been linked to violent behavior in previous studies. This study assessed the impact of demographic factors in three ways. First, correlational analyses were conducted to explore the relationship of demographic variables to all of the study variables. The results of these analyses are presented in Tables 16 and 17. Gender was associated with relationship characteristics, adolescent internal controls, and violent behavior. Being female was related to

lower conflict frequency with fathers and more behaviors promoting autonomous-relatedness in father-adolescent dyads. Compared to adolescent males, female adolescents showed more behaviors inhibiting autonomous-relatedness with mothers, however. Male adolescents reported lower levels of self-restraint and competence expectations; male adolescents also had higher levels of peer-reported violent behavior.

Insert Tables 16-17 here

Minority status and family income were related significantly ($r=.49$, $p<.001$), and their correlates tended to be similar. Higher family income was linked to higher levels of ego development for mothers, fathers, and adolescents. Minority status was associated with lower ego development for mothers and adolescents, but not fathers. Income was also associated with greater paternal monitoring and *increased* levels of paternal psychological control. Being of nonminority status and having higher income was linked to lower levels of conflict with mothers, and increased promotion of autonomous-relatedness within both mother-teen and father-teen dyads. Finally, minority status and lower income were related to higher levels of peer- and self-reported violent behavior.

The second way the study examined demographic factors was by accounting for them in each of the regression models of the major analyses, presented in the next section. In each of the regression models, family income, minority status, gender, and family structure were entered in the first step of the model. This assessed for main effects of demographic factors, as well as ensured

that any findings would be above and beyond the effects of these demographic factors.

Finally, an additional series of regression models were run to detect the presence of interaction effects between demographic variables and major construct composites. This would inform us whether obtained effects differ depending on different demographic characteristics of the adolescent. In the initial step, the adolescents' gender, minority status, household income, and family structure were entered. In the second step the major construct composite variable was entered. In the final step, interaction terms (the products of the major construct and each demographic variable) were entered as a block. No demographic interaction effects were discerned through these analyses.

Major Analyses

Following completion of the preliminary analyses, the major analyses aimed at addressing the primary research questions were undertaken. The two main questions of this study were (1) do parental internal controls, parenting practices, relationship characteristics, and adolescent internal controls predict adolescent violent behavior two years later?; (2) do these same factors predict changes (i.e. increases or decreases) in violent behavior between Time 1 and Time 2?

Analyses of Longitudinal Prediction

Major Construct Composites as Single Predictors. The first set of major analyses attempted to discern the nature of the relationship between the major family/individual construct composites and adolescent violent behavior two years later. This was done by testing a series of regression models. First, each of the four main composites (parent internal controls, ineffective

parenting practices, coercive parent-teen relations and adolescent internal controls) were tested separately as predictors of Time 2 violent behavior. Separate models were constructed for mothers versus fathers. All models were constructed in a similar fashion. In the initial step, the adolescents' gender, minority status, household income, and family structure were entered. In the second step, the major construct composite variable was entered, and the change in variance accounted for by the predictors was inspected to see if the major construct added significantly to the model, above and beyond the effects of demographic factors alone.

For models that examined the effects of mothers' internal controls, maternal ineffective parenting practices, coercive mother-teen relationship characteristics, and adolescent internal controls on violent behavior (referred to hereafter as "mother models"), all of the main constructs predicted adolescent violent behavior, in the expected directions. The results of each of these models are presented in Tables 18-21.

Insert Tables 18-21 here

Table 18 shows that after accounting for the effects of demographic variables, increased adolescent internal controls significantly predicted lower levels of violent behavior ($\beta = -.30$, $R^2 = .09$, $p < .001$).

Table 19 demonstrates that after accounting for demographic variables, maternal ineffective parenting practices predicted violent behavior ($\beta = .25$, $R^2 = .06$, $p < .01$). In Table 20, male gender predicted violent behavior; in addition, mother-teen coercive relations are shown to predict violent

behavior after accounting for demographic effects ($\beta=.21, R^2=.03, p<.05$). Table 21 shows that male gender and mothers' decreased internal controls significantly predicted higher levels of violent behavior ($\beta=-.25, R^2=.05, p<.01$).

For models that examined the effects of fathers' internal controls, paternal ineffective parenting practices, coercive father-teen relationship characteristics, and adolescent internal controls on violent behavior (referred to hereafter as "father models"), the sample size was considerably smaller, with N s from 33 to 40. The reduction in statistical power made statistically significant differences more difficult to detect. Only one of the four main predictor constructs--adolescent internal controls--was significantly associated with violent behavior two years later, after accounting for demographic effects. In addition, gender was a significant predictor (see Table 22). Violent behavior at Time 2 was associated with being male and having low internal controls at Time 1.

Insert Table 22 here

Major Construct Composites as Simultaneous Predictors. After completion of analyses that accounted for demographic factors and featured single constructs as predictors, a set of models was constructed that entered all of the main composite constructs simultaneously, as a block. Tables 23 and 24 summarize these results.

Insert Tables 23-24 here

Table 23 displays results from the mother model predicting violent behavior, wherein demographic variables were entered in the first step, and all major construct composites were entered in the second step. The overall model was significant, explaining 28% of the variance in Time 2 violent behavior. As a block, the 4 major predictor constructs added significantly to the model. The only statistically significant regression coefficients were mothers' and adolescents' internal controls.

Table 24 displays the results for the father models, with all four predictor composites predicting Time 2 violent behavior simultaneously, after accounting for demographic effects. The overall model was significant at the trend level, explaining 38% of the variance. The addition of the predictor constructs did not add significantly to the model; therefore the beta-weights were not be interpreted.

Figures 8 and 9 summarize the results obtained to this point. For mother models (Figure 8), adolescents' and mothers' internal controls predicted Time 2 violent behavior, regardless of whether they were entered into the model as single predictors or simultaneously with other variables. Maternal ineffective parenting practices and mother-teen coercive relations predicted Time 2 violent behavior as single predictors, but did not hold up as a predictors when entered simultaneously with other variables. For father models (Figure 9), only adolescents' internal controls predicted Time 2 violent behavior.

Insert Figures 8 & 9 here

The strength of this effect was actually greater than the effects found in analyses with mothers. When entered simultaneously with other variables, however, the overall model was no longer statistically significant. Adolescent gender was a significant predictor for Time 2 violent behavior; this strength of the overall model was also reduced when all predictors were entered together in the same model. These analyses suggest that mothers' internal controls and adolescents' internal controls are solid predictors of violent behavior. Direct effects of ineffective parenting practices and coercive relationship characteristics, when evident, do not seem as robust.

Testing for Mediating and Moderating Effects. After examining how each of the familial and individual construct composites were related to violent behavior separately and simultaneously, the next sets of analyses focused on ways these different constructs may relate to one another in predicting violent behavior. Two possible mechanisms were explored: (1) moderating mechanisms, where one factor's effects are seen only at different levels of another; and (2) mediating mechanisms, where the effect of one factor on violence operates indirectly, vis-a-vis its effect on another factor. Results from analyses testing moderating and mediating models are described below.

To test for moderating mechanisms, hierarchical regression models were constructed which entered demographic variables in the first step, major construct composites in the second step (to assess main effects), and the interaction term or product of the two construct composites being

examined (to assess interaction or moderating effects) in the final step. No interaction effects were observed for mother or father models predicting Time 2 violent behavior.

To test for mediating effects, a series of hierarchical regression models were constructed in accordance with Baron & Kenny's (1986) specifications for examining mediating models, which were described earlier. As mentioned previously, mediation can be established if four conditions are met: (1) the independent variable must affect the dependent variable; (2) the independent variable must affect the mediator; (3) the mediator must be shown to affect the dependent variable after the specific effect of the independent variable on the dependent variable is taken into account; (4) the effect of the independent variable on the dependent variable must be reduced when the effect of the mediator on the dependent variable is accounted for. In the first of these models, demographic variables and the independent variable were entered simultaneously to test condition 1. In the second model, demographic characteristics and the independent variable were used to predict the mediator variable, in order to test condition 2. In the third model, demographic variables are entered simultaneously with both the independent variable and the mediator, to test conditions 3 and 4.

Mediating effects were found in two models. In the first model, adolescent internal controls were found to mediate the relationship between maternal ineffective parenting practices and adolescent violent behavior. Said differently, the direct effect of ineffective parenting practices on violent behavior (partial $r = .25$, $p < .01$) was reduced when adolescent internal controls was entered into the model simultaneously (see Figure 10). The second mediational model was similar to the

first. In this case, adolescent internal controls mediated the relationship between coercive mother-teen relationship characteristics and adolescent violent behavior. The direct effect of coercive mother-teen relations on violent behavior (partial $r=.21$, $p<.05$) was reduced when the effects of adolescent internal controls were accounted for in the model (see Figure 11). Maternal ineffective parenting practices, coercive mother-teen relationship characteristics, and adolescent internal controls were not found to mediate the relationship between mothers' internal controls and violent behavior. In addition, no mediating relationships were found across the father-adolescent analyses predicting violent behavior.

Insert Figures 10 & 11 here

In review, while no moderating effects were found among individual and family variables, two mediating relationships were discovered. The influences of ineffective parenting practices and coercive mother-teen relations on violent behavior were found to be indirect, through their impact on adolescent internal controls.

Analyses of Change

Major Construct Composites as Single Predictors. The second set of major analyses considered whether each of the family and individual construct composites predicted *changes* in violent behavior between Time 1 and Time 2. Models tested in this set of analyses took into account violent behavior at Time 1 before adding the major family and individual constructs into

the models. All models were constructed in the same way. Demographic variables were entered in the first step, followed by Time 1 violent behavior in the second step, and major construct composites in the third step. As with the first sets of analyses, separate models were tested for mother-adolescent and father-adolescent dyads.

The stability coefficients for violent behavior between Time 1 and Time 2 were consistently strong for mother models ($\beta=.47-.53$) and father models ($\beta=.45-.49$). After accounting for this stability, none of the individual or familial construct composites was associated with violent behaviors. This was the case for both mother-adolescent and father-adolescent models. However, one model was significant at the trend level. Mothers' internal controls at Time 1 predicted change in violent behavior between Time 1 and Time 2 ($\beta=-.15$, $p=.07$, $\Delta R^2=.02$). Mothers who demonstrated lower internal controls at Time 1 had adolescents who became increasingly violent between Time 1 and Time 2 (see Table 25).

Insert Table 25 here

Major Construct Composites as Simultaneous Predictors. After completion of analyses that accounted for demographic factors, Time 1 violent behavior, and featured single constructs as predictors, a set of models was constructed that entered all of the main composite constructs simultaneously, as a block in the third step. Neither the mother-adolescent model nor the father-adolescent model was statistically significant, therefore regression weights were not interpreted.

Testing for Mediating and Moderating Effects. After examining how each of the familial and individual construct composites were related to violent behavior separately, the next sets of analyses focused on ways these different constructs may relate to one another in predicting changes in violent behavior. Once again, mediating and moderating mechanisms were explored using the same analytical strategies described previously; the only difference was that Time 1 violence was always taken into account after demographic variables. Results from analyses testing moderating and mediating models are as follows.

Moderating effects were found in two models. In the first, the interaction of mothers' internal controls with teens' internal controls predicted changes in violent behavior between Time 1 and Time 2 (see Table 26). Adolescents' low internal controls predicted increases in violent behavior over time only when mothers' internal controls were also low. This effect is depicted in Figure 12.

Insert Table 26 & Figure 12 here

In the second model, the interaction of mother-teen coercive relations and adolescent internal controls predicted changes in violent behavior over time (see Table 27). Teens with low internal controls were more violent over time only if there were higher levels of negativity and conflict in their relationships with their mothers (see Figure 13). Because the interaction effect was significant

at the trend level ($p=.06$), these effects should be interpreted with caution.

Insert Table 27 & Figure 13 here

Given the presence of a direct effect (albeit at the trend level) of mother internal controls on changes in violent behavior, further regression analyses were conducted to test the possibility that this effect was mediated by maternal ineffective parenting practices, coercive mother-teen relations, or adolescent internal controls. No evidence of mediation (or indirect effects) was discovered through these analyses.

In sum, there were notably few predictors of change in violent behavior over time. The trend for low mother internal controls to predict increases in violent behavior between Time 1 and Time 2 was better explained by the interactions of mother internal controls with adolescent internal controls and coercive mother-teen relationship characteristics. Adolescents were at highest risk for increasing violent behavior over time when: (a) both mothers and teens had low internal controls; and (b) when mothers had low internal controls and mother teen-relations were coercive and conflictual.

Analyses of Serious Violent Behavior

Additional analyses were conducted to explore whether predictors of violent behaviors (including less serious forms of violence, such as fighting behavior) were different from predictors of serious violent behaviors only. These analyses were run in the same fashion as those described

above; the only difference was that serious violent behavior was the dependent variable. Demographic characteristics were entered into the models in the first step. Separate models were conducted for mother-adolescent and father-adolescent dyads. Predictor variables were entered singly, and then simultaneously as a block. Models testing mediational and interactive effects were then explored. These procedures were repeated to examine predictors of change in serious violence over time. The results of these analyses are summarized here, but the tables and figures that correspond to these analyses are presented in Appendix K.

When examining the effects of single predictors within mother-adolescent dyads, two of the four main constructs, mothers' internal controls and adolescent internal controls, each remained significant predictors after accounting for demographic factors (see Appendix K, Tables K1 and K2). In both of these models, higher internal controls predicted lower levels of serious violent behavior. For models that considered single predictors within father-adolescent dyads, low adolescent internal controls was the only significant predictor of serious violent behavior after taking demographic variables into account (see Table K3). However, fathers' ineffective parenting practices were associated with Time 2 violent behavior at the trend level (see Table K4).

In the next set of analyses, predictors of Time 2 serious violent behavior were entered simultaneously, as a block. Table K5 contains the results from the mother-adolescent model. This model explained 21% of the overall variance in serious violent behavior. The addition of the 4 predictor constructs was a significant addition to the model, and there were main effects for both adolescents' and mothers' internal controls (see Figure K1). Table K6 shows the results for the

father-adolescent model predicting Time 2 serious violent behavior. The overall model was significant, accounting for 44% of the variance in Time 2 violent behavior. As a block, the addition of the predictor constructs added to the model, although none of the individual regression coefficients were significant above the trend level. Main effects for paternal ineffective parenting practices and adolescent internal controls were evident at the trend level (see Figure K2).

There was no evidence of mediating or moderating effects.

The final set of analyses examined predictors of change in serious violence between mid- and late adolescence. Compared to the stability coefficients for violent behavior, the stability for serious violent behavior was somewhat lower ($\beta=.26-.34$ for mothers; $\beta=-.03-.25$ for fathers²). Interestingly, Time 2 serious violent behavior was predicted by the interaction of Time 1 violent behavior and family structure (see Figure K3), although this interaction effect was a trend ($\beta=-.16$, $p<.10$). Adolescents who displayed higher levels of serious violence at Time 1 were more likely to have high rates of Time 2 serious violence if they came from a nonintact family.

There were no main effects for any of the predictors of change in serious violent behavior, whether predictors were entered singly or as a block. Because no direct effects existed, there was no need to examine indirect effects. When testing for moderating effects, one finding emerged, although it was significant only at the trend level. The interaction between mothers' internal controls

²The stability coefficients ranged across different models depending on the other predictors in the model. For example, in the model that predicted change in serious violence from father-teen relationship characteristics, the stability coefficient was .25. When paternal parenting practices was the predictor, the stability coefficient was -.03.

and mother-teen coercive relations predicted changes in serious violent behaviors over time (see Table K7). Low maternal internal controls predicted increases in serious violent behaviors over time only in the presence of *lower* levels of mother-teen coercive relations (see Figure K4). It may be that, for these mothers, lower levels of conflict and negativity represents withdrawal or disengagement from their adolescents. Because the interaction effect was significant at the trend level ($p=.06$), it should be interpreted with caution.

In sum, mother internal controls and adolescent internal controls, as measured in mid-adolescence, both predicted serious violent behavior in late adolescence. This was the case whether these variables were entered as single predictors or simultaneously with other predictors--a result that was identical to the results obtained for violent behavior. Unlike results for mother-adolescent predictors of violent behavior, however, there was no association between ineffective maternal parenting practices or coercive mother-teen relationship characteristics and serious violent behavior. Fathers' ineffective parenting practices and adolescent internal controls predicted serious violent behavior when entered into models singly or simultaneously with other variables; however, this was significant at the trend level. This was different from father-adolescent models predicting violent behavior, in which only adolescent internal controls were significant.

Discussion

Our objective was to examine two questions: (1) longitudinal prediction: what factors in

mid-adolescents are associated with increased risk for violent behavior in late adolescence?; and (2) change: what family or individual factors predict changes (increases or decreases) in violent behavior between mid- and late adolescence? Four major findings emerged. First, lack of internal controls in mid-adolescence predicted violent behavior in late adolescence. This finding was consistent across mother-adolescent and father-adolescent models, and held true for both violent behaviors and serious violent behaviors. The second finding was that mothers' lack of internal controls as measured at Time 1 predicted violence and serious violence at Time 2. This direct effect remained robust even when other family and adolescent variables were entered simultaneously into the model. Third, ineffective maternal parenting practices and coercive mother-teen relationship characteristics in mid-adolescence each predicted teens' violent behavior in late adolescence. However, these effects were mediated by adolescent internal controls. In other words, the relationship between ineffective parenting practices/ coercive relationship characteristics and violent behavior was explained largely by the effects of these variables on adolescent internal controls, which in turn were linked to violent behavior. Fourth, changes over time in violent behavior were predicted by the interaction of mother and adolescent internal controls, such that adolescents who had low internal controls and who had mothers with low internal controls demonstrated increases in violent behavior between mid- and late adolescence. These findings are each discussed in detail below.

The first major finding was that adolescent internal controls in mid-adolescence predicted lower levels of violent behavior in late adolescence. Adolescents who showed low levels of violent

behavior in late adolescence were teens who, in mid-adolescence: (1) displayed higher levels of ego development, (2) reported higher self-restraint, (3) believed they could perform socially competent behaviors in situations of interpersonal conflict; and (4) held values that were similar to an important adult. This finding is entirely consistent with theories of crime which state that an individual's lack of self-control is evidenced in many ways, including a stronger tendency to engage in criminal and antisocial activities (Gottfredson & Hirschi, 1990). While a lack of self-control does not necessitate criminal, aggressive, or violent behaviors, it does increase the likelihood that these behaviors will be enacted. Indeed, the association between adolescent internal controls and violent behavior is significant, but far from perfect. This result builds on past work that has found a relationship between violent behavior and low self-control (Cherek, Moeller, Dougherty, & Rhoades, 1997; Lennings, 1991; Polakowski, 1994; Tinklenberg, Steiner, Huckaby, & Tinklenberg, 1996), by extending the finding into a school-based sample of adolescents. It is also consistent with a host of studies that have linked hyperactivity, inattention, and impulsivity in childhood and early adolescence to violent behaviors in late adolescence and adulthood (Hawkins et al., 1998). Different from past research, this study used a composite measure of internal controls that may reflect not only the tendency towards undercontrolled behavior, but a broader information processing structure which includes self-knowledge about that tendency.

The second finding was that mothers' internal controls as measured at Time 1 predicted violent behavior at Time 2. Specifically, mothers with low internal controls at Time 1 had adolescents who displayed more violent behavior at Time 2. This direct effect remained significant

even when other familial and adolescent variables were entered simultaneously into the model. Prior research has found links between parental characteristics and adolescent violent behavior. In particular, parental criminality has been related to violent behavior in offspring (Baker & Mednick, 1984; Farrington, 1989). However, this study was the first to examine low parental internal controls as a risk factor for youth violence. Fathers' self-restraint has been linked to sons' adjustment problems including risk behaviors and poor conflict resolution skills, but not to violent behavior specifically (D'Angelo et al., 1995). A dearth of parental internal controls may be an important underlying substrate among some of the parental characteristics that have been linked to adolescent aggressive and violent behavior, such as parental aggression, criminality, mental illness, and suicidal behavior (Blum & Rinehart, 1997; Farrington, 1989; Hawkins et al., 1998; Pfeffer et al., 1983). While the existence of this direct effect was expected, the fact that the effect was not partially mediated by parenting practices, parent-teen relationship characteristics, or adolescent internal controls was somewhat surprising. Based on the theoretical literature, an expected result would have been that parents with low internal controls would have more conflictual relationships and ineffective parenting practices; these things in turn would be linked to violent behavior directly, or indirectly through adolescent internal controls (Capaldi, Chamberlain, & Patterson, 1997; Gottfredson & Hirschi, 1990; Reid & Patterson, 1989; Wahler & Dumas, 1986). However, some research indicates that parental characteristics can be associated with conduct problems in children, independent of intervening variables, such as parenting practices (Frick et al., 1992). The challenge posed by the current findings is in discerning the mechanisms

through which parental internal controls contribute to violent behavior in their offspring.

The third major result was that ineffective maternal parenting practices and coercive mother-teen relationship characteristics in mid-adolescence each predicted teens' violent behavior in late adolescence. However, these effects were mediated by adolescent internal controls. In other words, the relationship between maternal ineffective parenting practices/ coercive mother-teen relationship characteristics and violent behavior was explained largely by the effects of these variables on adolescent internal controls, which in turn was linked to violent behavior. The fact that ineffective parenting practices were associated with violent behavior is in accordance with numerous studies that have found links between poor family management practices and violent behavior. These include: lack of monitoring/supervision (Gorman-Smith et al., 1996), aggressive or harsh discipline (James, 1995; McCord, 1979), and authoritarianism/high strictness (Farrington, 1989). Likewise, the finding that mother-adolescent coercive relations was associated with violent behavior was consistent with literature that underscores how aggressive children engage in conflictual, coercive exchanges with parents that intensify over time (Morton, 1987; Patterson, Reid, & Dishion, 1992). The finding that these associations were mediated by adolescent internal controls has not been reported before in the violence literature, but it makes sense given other theoretical and empirical work.

Gottfredson and Hirschi (1990) believed that differences in self-control are produced mainly by family socialization practices. Social learning theory emphasized observational learning and direct experience as key processes for the acquisition and maintenance of aggressive behavior

patterns (Bandura, 1973). Patterson's social interactional model went further to implicate ineffective parenting and maladaptive parent-child interactions as providing direct training experiences for the development of antisocial behavior, including aggression (Patterson et al., 1989; Pepler & Slaby, 1994). Such experiences may be viewed as missed opportunities to help children and adolescents develop internal controls; rather, they may reward coercive and aggressive behaviors (Capaldi et al., 1997). Similar to the results obtained in this study, Feldman and Weinberger (1994) found that self-restraint mediated the relationship between parenting practices and delinquency. These findings suggest parenting practices and parent-adolescent relationship qualities are important familial processes in the development of violent behavior, insofar as they affect the development of adolescent internal controls or self-regulatory mechanisms.

The fourth major finding of this study was that changes over time in violent behavior were predicted by the interaction of mother internal controls and adolescent internal controls. Adolescents who had low internal controls and who had mothers with low internal controls demonstrated relative increases in violent behavior between mid- and late adolescence. This was an especially impressive finding, given the stability of violent behavior between mid and late adolescence. The stability coefficients for violent behavior in this study were comparable to what other studies have found (Huesmann et al., 1984). In addition, change in violence over time was predicted (at the trend level) by the interaction of adolescent internal controls and coercive mother-teen relationship characteristics. Teens who had low internal controls and experienced high conflict and low autonomous-relatedness in interactions with mothers were more likely to increase their

violent behavior between mid- and late adolescence. There exists relatively little literature that addresses the familial or individual characteristics that predict increases or decreases in violent behavior over time. Of interest here is that within this study, no single construct predicted changes in violent behavior over time; only the interaction of adolescent internal controls with two other constructs predicted change. This suggests that the adolescent internal controls and mothers internal controls may serve as “gates” that decrease the likelihood of violent behavior occurring. As long as either one of these gates remains in place, adolescents' levels of violent behavior over time remain stable. However, if both gates are removed, violent behavior increases. This effect is consistent with literature that highlights how risk factors are cumulative: the greater the number of risk factors present, the stronger the likelihood that violent and antisocial behaviors will be exhibited, or that the violent behaviors exhibited will be more extreme (Saner & Ellickson, 1996)

Worth mentioning is the fact that all parent-related effects (effects related to parent internal controls, ineffective parenting practices, and coercive parent-teen relations) were found for mothers only. Unlike mothers' internal controls, fathers' internal controls were not linked to adolescent violence. In addition, there were no direct or indirect effects for paternal ineffective parenting or father-teen relations. This finding is in contrast to other studies that have found fathers' characteristics and behaviors important with regard to the development of undercontrolled and violent behaviors in their offspring (D'Angelo et al., 1995; Pfeffer et al., 1983; Stewart & deBlois, 1983). These results may be attributable to several possible reasons. First, given the relatively small number of fathers in this sample, effects are more difficult to detect. Several father-related

effects were significant only at the trend level. However, some of the father-related effects were notably stronger than mother-related effects. Second, relative to the full sample, the father sample may have less variability with regard to constructs of interest. In addition, most of the father sample represents two-parent families, in which these processes may function differently. This explanation seems unlikely, given that no main or interaction effects were found for family structure (intact versus nonintact). Finally, adolescent aggressive behavior patterns may be more strongly influenced by mother-adolescent interaction patterns than by father-teen interaction patterns. Some research suggests that adolescents imitate aggressive behavior and anger management strategies of their mothers, particularly when dealing with anger in situations outside of the home (Bjorkqvist, 1997).

Exploratory analyses were conducted to evaluate whether the factors that predicted a broader band of violent behaviors—including those that are less violent, such as threatening and physical fighting—also predicted the most serious violent behaviors assessed in the study. These analyses were considered exploratory because the study within which these data were collected was not designed as a study of violent behavior. Moreover, the base rates of serious violent behaviors within the sample were relatively low (for example, only 2% reported robbery, 6% reported aggravated assault), creating a sizable reduction in the statistical power of all analyses with these data. With those caveats in mind, the results from these analyses showed that predictors of serious violence were similar to the predictors of more “broad band” violence. Specifically, the first two major findings of this study were replicated: adolescent lack of internal controls and mothers’ lack of internal controls were both found to predict serious violent behaviors in late

adolescence. However, the third main finding--that both maternal ineffective parenting practices and mother-adolescent coercive relations were indirectly related to violent behavior via their link to adolescent internal controls--was not sustained when serious violent behavior was the outcome. In addition, paternal ineffective parenting practices were found to be related to serious violent behavior at the trend level, a pattern that was not evident when predicting violent behavior. Change in serious violence was also predicted by a trend-level interaction effect, but not the same interactions that predicted changes in broad band violent behavior: in this case it was the interaction between mother internal controls and mother-adolescent coercive, conflictual relations that predicted changes in serious violence. Increases in adolescent violent behavior between mid- and late adolescence were most likely when mother internal controls were low and when coercive relations were also low. For these adolescents, a lack of conflictual mother-adolescent interactions may signify maternal indifference or withdrawal. This finding also supports the idea that changes in violent behavior over time may be predicted by the presence of multiple interacting risk factors. Thus, while the results for serious violent behavior appear in many ways similar to the results for violent behavior, the question of differential patterns of risk factors for different types of violent behavior remains a good one and should be pursued in a study better suited to address it. Such a study should not only consider the kinds of the violent activities in question, but their function and significance (e.g. instrumental vs. impulsive, solitary vs. in a group context). In other words, studies should seek to discover both "what they did" as well as "how, where, and why they did it". Recent work that has attempted to elucidate the context of youth violent behavior has found that violent

behavior has different meanings, motivations, and outcomes, depending on the context (Fagan, 1998).

The results from this study raise several questions. One implication of this study's results is that parent and adolescent internal controls are important factors associated with adolescent violent behavior and changes in violent behavior. If that is so, what is the nature of these internal controls and how do they function to regulate behavior? Do internal controls reflect a biological reality (such as the underfunctioning of the brain's system for behavioral inhibition) (Barkley, 1997)? Do they reflect an unconscious set of assumptions through which internal and external stimuli are interpreted or assimilated in order to derive meaning (Weiner, 1996)? Or are they more conscious aspects of functioning, as in attitudes, beliefs, or certain elements of self-knowledge (Guerra & Slaby, 1990)? These different dimensions are difficult--perhaps impossible--to tease apart. Within the current study's approach to the measurement of internal controls, it is likely that all three components are reflected.

Different writers have described internal controls in various ways, but one common element across different descriptions of internal controls is the suppression of impulses in favor of longterm goals over the immediate gratification of self-focused needs and desires (Feldman & Weinberger, 1994; Gottfredson & Hirschi, 1990; Wilson & Hernstein, 1985). A key question here is what causes people to resist immediate impulses. Whether or not acting out certain aggressive impulses (or suppressing them) involves some conscious or unconscious *decision* is unclear, and a matter of some debate among scholars. Baumeister and Heatherton (1996) maintained that the idea of

irresistible impulses are highly questionable, noting that giving into a lack of self-restraint is a choice, and to view it otherwise may justify or even encourage assaultive behavior (as cited in Berkowitz, 1997). This notion, that engaging in violent behavior is a choice, has been used within many violence intervention programs, as it heightens a sense of personal responsibility for one's actions. The Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition (DSM-IV) contains an entire chapter on "impulse-control disorders", of which the essential feature is "the failure to resist an impulse, drive, or temptation, that is harmful to the person or to others" (American Psychological Association, 1994, p. 609). The DSM-IV does not take a clear position on whether the failure to resist an impulse is a choice; however, in the case of Intermittent Explosive Disorder, the disorder is not thought to embody purposeful behavior, in which there may be motivation for personal gain in an aggressive outburst.

Directing behavior towards the fulfillment of long-term goals, rather than immediate desires is facilitated by several different kinds of cognitive and neuropsychological "executive functions". Barkley (1997) defined executive functions as "mainly private (cognitive) self-directed actions that contribute to self-regulation", a definition which incorporated several attributes: "(a) self-directed actions; (b) the organization of behavioral contingencies across time; (c) the use of self-directed speech, rules, or plans; (d) deferred gratification; and (e) goal-directed, future-oriented, purposive, or intentional actions." (p. 68). Barkley described 4 different executive functions: working memory (e.g. holding events in mind, forethought, anticipation), self-regulation of affect/motivation/arousal (e.g. emotional self-control, social perspective taking), internalization of speech (problem solving,

self questioning, moral reasoning), and reconstitution (analysis and synthesis of behavior, behavioral simulations). He postulated that these executive functions bring behavior and motor activity under the control of internally represented information. This formulation encapsulates the idea of internal controls: internally represented information controlling behavior. Internal controls may be thought of as a kind of meta-executive function, the execution of which depends on other kinds of sub-executive functions, such as the ones Barkley described (Barkley, 1997).

Consistent with this idea that lowered self-restraint among violent youth reflects problems with executive functions, is the mounting body of literature describing social-cognitive difficulties among violent and aggressive youth (Pepler & Slaby, 1994). Slaby and Guerra (1988) examined social problem-solving skills and beliefs about aggression among violent incarcerated youth, aggressive high school students, and nonaggressive high school students. The violent adolescents had the most serious social problem-solving deficiencies and held beliefs that were likely to maintain aggressive behavior (e.g. aggression is legitimate and increases self-esteem). Results indicated a continuum of these beliefs and skills such that aggressive students were midway between violent adolescents and nonaggressive students (Slaby & Guerra, 1988). Similarly, compared to nonaggressive children, aggressive children reported that it was easy to perform aggressive actions, difficult to inhibit aggressive impulses, and were confident that aggressive actions would both produce tangible rewards and reduce aversive behavior from others (Perry, Perry, & Rasmussen, 1986). In addition, Lochman and Dodge (1994) found that certain social-cognitive variables discriminated between violent, moderately aggressive, and nonaggressive boys. For instance,

relative to the other groups, violent boys had poorer recall of social situational cues, more hostile attributions, and outcome evaluations favoring aggression (Lochman & Dodge, 1994). While a number of social-cognitive models that link cognitions to aggression have been posed (e.g. social information-processing model, social problem solving paradigm, cognitive mediators paradigm), these overlapping models have not been unified within a single theory (Pepler & Slaby, 1994). Barkley's (1997) formulation of executive functions could serve as singular framework within which to understand the complex relationship of cognition to the development of aggressive behavior, as it is sufficiently broad to encompass different kinds of social-cognitive processes.

It is important to note that internal controls or self-regulatory executive functions reflect not only cognitive *processes* (e.g. memory problems), but cognitive *content* as well. Several different kinds of cognitions and beliefs have been linked to violent behavior, including beliefs about social norms (Farrington, 1989; Kingery et al., 1996; O'Donnell et al., 1995), beliefs about the value or benefits of violence and aggression (Guerra et al., 1995; Rauste-von Wright, 1989), and perceived risk of an untimely death (Blum & Rinehart, 1997; DuRant et al., 1995a). Such beliefs may be heavily influenced by social-environmental features. For example, in communities characterized by high rates of violence and mortality, beliefs about violence may differ dramatically from communities with low rates youth mortality. In a sample of youth from highly violent, urban neighborhoods, engaging in violent behavior helped youths to create and maintain status as a "tough" person, a reputation that affords power and protects against victimization (Fagan, 1998). While internal controls have a neuropsychological basis, they also may be strongly related broader,

contextually influenced beliefs, values, and “outlooks on life”.

A second implication of this study is that parenting practices, relationship characteristics, and other aspects of family functioning, may exert effects on violent behavior through their impact on internal controls. How do these mechanisms actually work? Said differently, what are the processes through which internal controls develop? Given that internal controls are complex and multifaceted, it is likely that their development is multidetermined. Part of the link between parent and adolescent characteristics or behaviors is genetically driven. Some temperamental factors relevant to internal controls, such as anger proneness, impulsivity, inhibitory control, have been found to be heritable (DiLalla & Gottesman, 1989; Goldsmith & Gottesman, 1996). Genetic risk for undercontrolled behavior may be more likely to result in such behavior in the presence of socioenvironmental risk factors.

Social learning theories have been most prominent among notions of socioenvironmental risk for the development of aggressive behavior. Social learning theory posits that aggressive behaviors (and presumably behavioral self-control) are learned and maintained through: (1) observational learning from live models or the media; (2) direct experience with aggression and its positive or negative consequences; and (3) self-regulative influences such as self-reward, punishment, or other evaluative self-reactions (Bandura, 1973; Pepler & Slaby, 1994). Parents are instrumental in facilitating these functions.

Parents serve as live models through which children learn how to manage conflict and to express emotion (Baron & Richardson, 1994). Parents’ interactions with children, spouses, or

other adults may serve as learning experiences through which children come to understand what is normal or acceptable standards of behavior. However, the process of observational learning through parental models is not quite as simple as mechanically performing actions witnessed. The extent to which children imitate models hinges on at least 4 factors: (1) the degree of similarity between the model situation and the actual situation; (2) identification with the model; (3) whether the model is successful or not; (4) the amount of exposure to the model (Bjorkqvist, 1997). Huesmann (1988) proposed that children learn cognitive “scripts” from models, which become stable through rehearsal over time; these scripts are thought to influence emotional reactions and to serve as internal standards that contribute to the selection of possible behavioral responses. Similarly, McCord (1988) believed that parents’ aggressive behaviors result in children’s antisocial behavior through implicit messages that expressive and injurious behaviors are both normal and justified, and egocentrism is acceptable, if not virtuous. Such messages may be incorporated into children’s value structures and normative beliefs which support undercontrolled behavior.

While this study showed that internal controls mediated the link between some parent-related variables (i.e. ineffective parenting practices and coercive parent-teen relations) and violent behavior, this mediating effect did not apply to parental internal controls. In addition, this study did not consider parental aggression in its own right, but rather, as a part of the ineffective parenting composite. Given that there is no measure of parents' aggressive or undercontrolled *behaviors*, it is difficult to assess the modeling hypothesis. It is possible that modeling effects could be in operation, insofar as parents' undercontrolled behaviors reflected within family interactions or

parenting practices could be observed and internalized.

Parents also influence children's and adolescents' direct experiences with aggression in that they are often responsible for providing consequences for such behavior. Gottfredson and Hirschi (1990) suggested that parents help children develop self-control using three processes crucial to effective child-rearing: (1) monitoring children's behavior; (2) recognizing undercontrolled behavior when it occurs; and (3) punishing such behavior. Parents efforts to manage undercontrolled behavior may improve or worsen such behavior patterns. Ineffective parenting--defined in terms of inconsistency, rejection, and power assertiveness/harsh discipline--has been associated with preadolescents' inability to exercise self-control across a number of situations (Feldman & Weinberger, 1994). Conversely, parenting characterized by acceptance, non-authoritarian punishment strategies, and parent-child identification, has been associated with higher levels of ego development over time (Dubow et al., 1987). The social-interactionist model emphasized that ineffective parenting and maladaptive parent-child interactions can reinforce children's use of coercion, aggression, and antisocial behavior (Patterson et al., 1992). Thus, in addition to parenting practices, patterns of family interaction are thought to be influential in adolescents' behavioral and personality development. Parents and siblings negative reinforcement of aggressive behavior has been linked to child antisocial behavior, via its impact on child irritable/aversive behavior within the family (Snyder et al., 1997). Hauser and colleagues (1991) showed that certain kinds of family interactions--"constraining" and "enabling" interactions--were related to adolescents' ego development. Parents efforts to promote autonomy in interactions with

adolescents predicted gains in ego development over time (Allen, Hauser, Bell, & O'Connor, 1994). In sum, a major task for parents is to help children develop self-control gradually, such that they integrate mechanisms for self-control within their personality structure and no longer need to rely heavily on external control mechanisms (Feldman & Weinberger, 1994). The results from this study are consistent with these possible mechanisms for the development of internal controls.

The current study also holds implications for prevention and intervention efforts. The identification of children with an increased likelihood of becoming violent is an important first step (Loeber & LeBlanc, 1990; Quinn, Mathur & Rutherford, 1995). This study found that adolescents who have low internal controls are more likely to demonstrate violent and aggressive behaviors in the future. Children and adolescents who demonstrate low behavioral self-control could be identified (by parents and teachers) for secondary prevention programs. As a criterion for program inclusion, low self-control has empirical, theoretical, and practical relevance, all of which are important standards to consider when selecting a screening variable (LeBlanc, 1998). Interventions for individual children and adolescents should emphasize building self-restraint by: (1) teaching strategies for self-monitoring of affect and interruption of escalating arousal; (2) developing adolescents' sense of choice over their possible responses to situations; (3) practicing self-restrained behaviors across a variety of situations; (4) helping adolescents envisage long-term goals and what is required on their part to realize them; (5) providing opportunities to discuss the norms, beliefs, and values which can promote or undermine behavioral self-control. Programs that incorporate cognitive, affective, and behavioral skills and combine multiple components are thought

to be most promising (Guerra, Tolan, & Hammond, 1994). In addition, intervention efforts need to address context-specific barriers to self-restrained and nonviolent behavior (Black, Howard, Kim, & Ricardo, 1998).

A widely noted criticism of many interventions is the failure to incorporate elements that address the multiple contexts of risk (Wasserman & Miller, 1998). Results from this study suggest that adolescent internal controls may be influenced by parental behaviors and family interaction patterns. A comprehensive intervention strategy should include family-based components that emphasize the importance of parents' self-control with regard to several domains: (1) monitoring and discipline; (2) responding to frustrating child behaviors; (3) verbal communication in family interactions; (4) parents' interactions with spouses and other adults. It also may be necessary to address factors that lead to the erosion of parental self-control, such as economic strain, marital dysfunction, psychological distress, psychiatric disorder, or substance abuse. Parenting interventions that emphasize self-control skills are extant (Baker, 1989; Barth, Blythe, Schinke, & Schilling, 1983; Wells, Griest, & Forehand, 1980). Multisystemic interventions that bolster parents ability to provide necessary structural constraints for their children have been found to aid in the reduction of serious problem behaviors, including violence (Henggeler, Melton, Smith, Schoenwald, & Hanley, 1993). It is important to note that these potential implications are predicated on confirmation of *causal* links between internal controls and violent behavior. Causality can not be assumed from the current findings, but this research suggests that causal hypotheses should be pursued strongly in future studies.

One of the findings of this study is that increases in violence over time is predicted by the interaction of multiple risk factors. It follows that, in order to prevent increases in violent behavior over time, programs must strive to reduce the total number of risk factors. Risk factors for violent behavior can be cumulative: the greater the number of risk factors, the higher the levels of violence (Saner & Ellickson, 1996). Even if interventions cannot address all problems within a dysfunctional system, it may still be worthwhile to curtail as many as is possible.

This study has a number of limitations. Because these data are correlational, causality among constructs cannot be assumed. While the conceptual model put forth posits that relationships between variables function in a certain directions (i.e. low adolescent internal controls lead to violent behavior), it is possible that these relationships are bidirectional or can be explained by "third variables" (i.e. self-reports of internal controls may be in part, based on the knowledge that one becomes violent at times). Similarly, the conceptual model is parent driven in its effects. Other models are certainly possible. In particular, child driven models may be in partial operation (Bell, 1979; Lytton, 1990). For example, adolescents with low internal controls may be difficult to parent; over time, parenting practices may become more ineffective and relationships may become more conflicted with more strained communication (Feldman & Weinberger, 1994). Some proportion adolescents who demonstrate aggressive behavior problems are on a developmental trajectory that started much earlier in life (Caspi, Elder, & Bem, 1987; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). Indeed, patterns of family interactions that are thought to be linked to violence, aggression, and other conduct problems begin well before adolescence

(Capaldi et al., 1997; Patterson et al., 1989). By mid- to late adolescence, the direction of effects between adolescent and parent behaviors is likely to be reciprocal. Therefore, the conceptual model chosen could be construed in a different fashion to reflect the dynamics occurring in adolescence specifically. Theoretically speaking, however, there is reason to suspect that familial and parental factors play heavily into the development of adolescent internal controls (Gottfredson & Hirschi, 1990; Kroger, 1996). Because of limitations of the sample, certain questions of interest could not be more thoroughly pursued. As mentioned previously, the number of fathers in the sample was small. This study examined mother-adolescent models and father-adolescent models separately. Future work in this area should consider the effects of both parents in the same models, in order to help further our understanding of the common and unique elements each parent contributes to socialization and the development of antisocial behavior. In addition, this sample does not contain a large number of seriously violent individuals. Although some exploratory analyses attempted to compare patterns of risk for violent versus seriously violent behaviors, this question could be better addressed by a study with a larger number of participants, a broader range of violence severity among participants, and more detailed measures of violent behavior (particularly for parent and peer reporters).

It is important to note that the conceptual model described in this paper represents one piece of much broader models that have been used to explain the development of antisocial and aggressive behavior patterns. In particular, socialization practices and family processes have been shown to mediate the relationship between economic strain and adolescent conduct problems

(Conger, Ge, Elder, Lorenz, & Simons, 1994; Dodge, Pettit, & Bates, 1994). Indeed, this study did find demographic differences, at least in terms of patterns of association with many of the major constructs. Other possible components that could be incorporated into the current model are the effects of marital discord and family stress on parenting behaviors, or the effect of peer relations on adolescent internal controls. This study was intended to focus on how certain familial and individual factors were related to violent behavior. As investigators elucidate different parts of the picture of how antisocial behavior develops, more comprehensive models that include the important factors from multiple ecosystems can be constructed (Black et al., 1998; Jonson-Reid, 1998).

In spite of these limitations, this study is the first of its kind to examine the interplay between familial factors and adolescent internal controls in relation to violent behavior in adolescence. Future research should develop models that attempt to differentiate among constructs that embody internal controls (i.e. information processing, values). Internal controls should be studied in a longitudinal fashion, in order to better understand their development over time; however, capturing internal controls at different ages may require distinct measurement strategies. Studies that integrate the biological and psychological elements of undercontrolled behavior and their links to violence are also needed (Burrowes, Hales, & Arrington, 1988, Linnoila et al., 1984). It is evident that there exist both genetic and environmental determinants of internal controls; further twin and adoption designs could help address the question of heritability. Finally, the question of how individual differences in parents internal controls results in different patterns of parenting, parent-child interactions, and characteristics/outcomes in children demands more empirical attention.

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Table 1.
Summary of Measures Included Within Major Constructs

Parent Internal Controls (*parent self-report*)

1. Parent ego development
2. Parent self-restraint

Parenting Practices

1. Monitoring (*parent report*)
2. Monitoring (*teen report*)
3. Parent to adolescent physical aggression (*parent report*)
4. Parent to adolescent physical aggression (*teen report*)
5. Psychological control (*parent report*)
6. Psychological control (*teen report*)

Parent/Adolescent Relationship Characteristics

1. Total conflict frequency (*parent report*)
2. Total conflict frequency (*teen report*)
3. Promoting autonomous-relatedness (*parent behavior to adolescent*)
4. Promoting autonomous-relatedness (*adolescent behavior to parent*)
5. Inhibiting autonomous-relatedness (*parent behavior to adolescent*)
6. Inhibiting autonomous-relatedness (*adolescent behavior to parent*)

Adolescent Internal Controls (*teen self-report*)

1. Adolescent ego development
2. Self-restraint
3. Self-efficacy expectations / identification with adult prosocial values

Adolescent Violent Behavior

1. Self reports
2. Peer reports
3. Parent reports

Adolescent Serious Violent Behavior Only

1. Attacking with intent to seriously hurt or kill (*self-report*)
 2. Participation in gang fights (*self-report*)
 3. Using force to obtain money or goods (*self-report*)
 4. Physically assaulting (jumping/mugging) others (*peer report*)
-

Table 2.
Descriptive Statistics for Measures Included Within Major Constructs

| | | Mean | S.D. | Range |
|---|------|-------|------|---------|
| <u>Parent Internal Controls</u> | | | | |
| 1. Mother ego development ^a | | 166.7 | 19.4 | 111-212 |
| 2. Father ego development ^a | | 172.6 | 22.1 | 135-240 |
| 3. Mother self-restraint ^a | | 50.4 | 6.3 | 30-59 |
| 4. Father self-restraint ^a | 50.2 | 6.0 | | 37-60 |
| <u>Parenting Practices</u> | | | | |
| 5. Maternal monitoring ^a | | 52.0 | 7.5 | 27-65 |
| 6. Maternal monitoring ^b | | 44.5 | 12.2 | 14-65 |
| 7. Paternal monitoring ^a | 52.2 | 6.5 | | 36-63 |
| 8. Paternal monitoring ^b | | 35.1 | 13.5 | 13-61 |
| 9. Maternal physical aggression ^a | | 3.2 | 3.2 | 0-17 |
| 10. Maternal physical aggression ^b | | 3.6 | 5.2 | 0-40 |
| 11. Paternal physical aggression ^a | | 2.2 | 2.9 | 0-10 |
| 12. Paternal physical aggression ^b | | 3.7 | 8.0 | 0-53 |
| 13. Maternal psychological control ^a | | 17.6 | 4.3 | 10-27 |
| 14. Maternal psychological control ^b | | 16.4 | 4.2 | 10-27 |
| 15. Paternal psychological control ^a | | 16.1 | 4.2 | 10-26 |
| 16. Paternal psychological control ^b | | 15.1 | 4.3 | 10-30 |
| <u>Parent/Adolescent Relationship Characteristics</u> | | | | |
| 17. Mother/teen conflict frequency ^a | | 0.98 | 0.67 | 0.1-4.3 |
| 18. Mother/teen conflict frequency ^b | | 0.89 | 0.66 | 0.1-3.9 |
| 19. Father/teen conflict frequency ^a | | 0.75 | 0.52 | 0.0-2.3 |
| 20. Father/teen conflict frequency ^b | | 0.58 | 0.77 | 0.0-4.2 |
| 21. Mother promoting A-R ^c | | 2.3 | 0.57 | 0.4-3.7 |
| 22. Teen promoting A-R with mother ^d | 1.6 | 0.65 | | 0.1-3.1 |
| 23. Father promoting A-R ^c | | 2.3 | 0.63 | 0.6-3.4 |
| 24. Teen promoting A-R with father ^d | 1.8 | 0.72 | | 0.3-3.5 |
| 25. Mother inhibiting A-R ^c | | 0.9 | 0.46 | 0.1-2.1 |
| 26. Teen inhibiting A-R with mother ^d | 1.0 | 0.52 | | 0.0-2.5 |
| 27. Father inhibiting A-R ^c | | 0.7 | 0.51 | 0.0-2.4 |
| 28. Teen inhibiting A-R with father ^d | 0.7 | 0.56 | | 0.1-2.0 |
| <u>Adolescent Internal Controls</u> | | | | |
| 29. Adolescent ego development ^b | | 147.8 | 19.7 | 92-206 |
| 30. Self-restraint ^b | | 40.4 | 8.2 | 17-59 |

| | | | |
|--|-----|-----|---------|
| 31. Self-efficacy expectations/ identification with adult values ^b | 3.5 | 1.1 | 0.2-5.6 |
|--|-----|-----|---------|

Table 2. (Continued)
Descriptive Statistics for Measures Included Within Major Constructs

| | Mean | S.D. | Range |
|--|------|-------|--------|
| <u>Adolescent Violent Behavior</u> | | | |
| 32. Self reports, Time 1 | 6.33 | 20.92 | 0-188 |
| 33. Peer reports, Time 1 | 1.59 | 0.71 | 1-3.75 |
| 34. Parent reports, Time 1 | 0.34 | 0.62 | 0-3 |
| 35. Self reports, Time 2 | 3.75 | 22.17 | 0-254 |
| 36. Peer reports, Time 2 | 1.58 | 0.61 | 1-3.5 |
| 37. Parent reports, Time 2 | 0.22 | 0.50 | 0-2 |
| <u>Adolescent Serious Violent Behavior Items</u> | | | |
| 38. Attacking to hurt/kill ^b , Time 1 | 0.16 | 0.59 | 0-4 |
| 39. Gang fights ^b , Time 1 | 0.16 | 0.72 | 0-7 |
| 40. Force to get money/goods ^b , Time 1 | 0.02 | 0.19 | 0-2 |
| 41. Jumping/mugging others ^e , Time 1 | 1.45 | 0.72 | 1-4 |
| 42. Attacking to hurt/kill ^b , Time 2 | 0.21 | 1.38 | 0-15 |
| 43. Gang fights ^b , Time 2 | 0.11 | 0.58 | 0-6 |
| 44. Force to get money/goods ^b , Time 2 | 0.31 | 3.42 | 0-40 |
| 45. Jumping/mugging others ^e , Time 2 | 1.5 | 0.76 | 1-4 |

Note: Raw values are given for all variables

A-R = Autonomous-Relatedness

^aParent report

^bAdolescent report

^cObserved parent behaviors

^dObserved adolescent behaviors

^ePeer report

**Table 3. Frequency of self-reported violent behaviors:
Percentage reporting at least 1 violent act in the last 6 months**

| | Time 1 (N=137) | Time 2 (N=137) |
|---|-------------------|-------------------|
| Attacked with intent to hurt/kill | 10% | 6% |
| Participated in gang fights | 8% | 7% |
| Hit/threatened to hit parent | 12% | 5% |
| Hit/threatened to hit co-worker | 5% | 9% |
| Hit/threatened to hit other | 53% | 31% |
| Used force/strong arm tactics | 1.5% | 2% |
| Total crimes vs. persons (sum of frequencies for the above 6 items) | 62% | 39% |

Note: Self reported violence measured by Self-Reported Delinquency (Elliott et al, 1983).

**Table 4. Frequency of peer-reported violent behaviors:
Percentage reporting at least some violent activity**

| | Time 1 (N=120) | Time 2 (N=125) |
|--|-------------------|-------------------|
| Gets into fights | 57.5% | 59% |
| Physically assaults ("jumps or mugs") others | 37% | 43% |
| Total peer-reported violence (sum of the above 2 items) | 62% | 65% |

Note: Peer reported violence measured by a modified version of the Adolescent Self-Perception Profile (Harter, 1988). At least one peer provided information; when 2 peers were available, their reports were averaged.

**Table 5. Frequency of parent-reported violent behaviors:
Percentage reporting at least some violent activity**

| | Time 1 (N=138) | Time 2 (N=131) |
|--|-------------------|-------------------|
| Gets into fights | 21% | 21% |
| Physically attacks people | 17% | -- |
| Total parent-reported violence (sum of the above 2 items) | 30% | -- |

Note: Parent reported violence measured by the Child Behavior Checklist (Achenbach, 1991). At least one parent provided information; when 2 parents were available, their reports were averaged. The "physically attacks people" item was dropped from the CBCL at Time 2.

Table 6.
Correlation Coefficients of Stability between Indicators
of Time 1 and Time 2 Violent Behaviors

| Indicator | Stability Coefficient (r) |
|---|---|
| Self Report | .42 |
| Peer Report | .47 |
| Parent Report | .44 |
| Composite: Violent Behavior | .56 |
| Composite: Serious Violent Behaviors Only | .40 |

Table 7.
Within Subjects T-Test Results for Difference Score Means of Indicators
of Time 1 and Time 2 Violent Behaviors

| Indicator | Mean, Difference Score | T Value |
|------------------|-------------------------------|----------------|
| Self Report | -0.18 | -5.18*** |
| Peer Report | -0.01 | -0.13 |
| Parent Report | 0.01 | 0.17 |

Note: This test determined whether difference score means were different from zero. *** $p < .001$.

Table 8.
Changes in Violent Behavior by Reporter

| | Self # (%) | Peer # (%) | Mother # (%) | Father # (%) |
|----------|---------------|---------------|-----------------|-----------------|
| Increase | 24 (17.4) | 42 (30.6) | 14 (10.1) | 2 (1.4) |
| Decrease | 60 (43.4) | 37 (26.8) | 18 (13.0) | 2 (1.4) |
| Same | 52 (37.7) | 34 (25.5) | 93 (67.4) | 32 (23.2) |
| Missing | 2 (1.4) | 25 (18.1) | 13 (9.4) | 102 (73.9) |

Note: N=138