THE CRACOW INSTRUMENT

AND MOFFIT'S DEVELOPMENTAL THEORY

OF JUVENILE DELINQUENCY

by

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ABSTRACT

Over the decade extending from the mid-1980s to mid-1990s, official crime statistics indicated a sharp upward trend in violent crime arrests of youth. A number of factors in the individual, family, and environmental domains have been shown to be associated with the etiology of juvenile violent crime and delinquency. Recently, a developmental perspective has gained influence in the understanding of delinquency, in which two distinct trajectories of antisocial behavior have been identified, hypothesized to result from interactions between different individual and environmental factors (Moffit, 1993, 1997). The purpose of the current study was to investigate risk correlates of these distinct trajectories using a new, developmentally-oriented risk needs tool, the Cracow Instrument. Institutional records of 78 American male delinquent juveniles were reviewed. Results indicated small but significant differences between violent and non-violent offenders in cognitive abilities, and problems in substance use and accommodation. Given a dearth of file information on risk in early developmental periods, no valid conclusions could be drawn regarding differences between early and late onset of antisocial behavior. Implications of results are discussed and suggestions for future research directions are provided.

DEDICATION

To my mother, who taught me to never give up, and to my father, who taught me the value of hard work, I dedicate this work with love and gratitude.

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INTRODUCTION

The problem of youth violence appeared to reach epidemic proportions in the decade extending from the mid-1980s to mid-1990s, with official crime statistics indicating a sharp upward trend in violent crime arrests for children and adolescents between ages 10 to 17 (U.S. Department of Health and Human Services, 2001). Attempts to curb this trend by the U. S. congress and many state legislatures have included passing new laws to control access to firearms, and a movement towards increasingly retributive responses by the formal justice system by increasing determinate sentencing and transfer to adult court (Bishop, Frazier, Lanca-Kaduce, & Winner, 1996; Kruh & Brodsky, 1997). Although the rate of violence appears to have declined in the United States since its' peak in 1993/1994, juvenile violent crime remains a problem (Herrenkohl et. al., 2000; U.S. Department of Health and Human Services, 2001). First, the decline in arrest rates observed since the early 1990s is not uniform for all types of violent crime. For example, the rate of arrests for aggravated assault was still almost 70% higher in 1999 than in 1983 (U.S. Department of Health and Human Services, 2001). Second, official crime statistics based on arrest records only show a partial picture of violence committed by youth. It is estimated that official crime statistics reveal about one-tenth of all violent behavior potentially leading to serious harm or injury perpetrated by youth as indicated by confidential reports by youth themselves. Therefore, a large proportion of violent crime never come to the attention of law enforcement agencies.

In Canada, approximately one in six persons charged with a violent offense is between the ages of 12 and 17. Research by the Canadian Center for Justice Statistics (CCJS, 1999) indicates that the rate of youth charged with violent crimes in Canada increased by 77% from 1988 to 1999. This represents a much greater increase than the

6% increase observed in adult violent crimes over the same time period. Although data based on the Canadian Uniform Crime Reporting Survey show that minor (common) assault accounted for a large proportion of the increase in male youth violent crime, aggravated assault has doubled since 1988 for both male and female youth. Similarly, the rate of youths charged with robbery had more than doubled in 1999 compared to a decade earlier, accounting for over one-third of all persons charged with robbery (Canadian Center for Justice Statistics, 1999). A recent longitudinal study investigating violent conduct of 150 adjudicated adolescent Canadian females found that close to three quarters of participants had engaged in at least one violent act preceding adjudication in mid-adolescence, indicating violence to be a common occurrence in this population (Lanctôt, Émond, & Le Blanc, 2004).

Delinquency as an Outcome of Development

Several theories have been put forth to explain the etiology of juvenile delinquency, and opinions diverge on conditions that contribute to juvenile delinquency and youth violence (Binder, 1988; Catalano & Hawkins, 1996; Gove, 1985; Saner & Ellickson, 1996; Wisdom, 1986). A variety of individual, familial, and social structures have been implicated, and whereas some have argued that delinquency is caused by a single construct, other assert there are distinct risk factors associated with certain types of problems (e.g., Loeber, Farrington, Stouthamer-Loeber, & Van Kamen, 1998). Recently, a developmental perspective, where delinquency is viewed in terms of how youth's personal characteristics interact with their social context, has gained influence. A developmental perspective emphasizes the importance of adopting a transactional and ecological view of psychopathology where it is important to consider children's behavior in its' context (Campbell, 1998). Psychopathology is not simply considered an

expression of an individual's endogenous influences, but maladaption is viewed as a result of a myriad of risk and protective factors operating over time (Sroufe, 1997). Furthermore, proponents of this perspective assert that individuals' abilities and behavioral repertoires vary at different stages in development, and patterns of behavior change over the span of an individual's life. Research focused on understanding the etiology of juvenile delinquency has found support for two distinct trajectories of delinquency; an early onset trajectory beginning in childhood frequently associated with chronic and even life long offending, and a later onset in adolescence typically associated with temporary involvement with criminal activity. These two trajectories appear rooted in different developmental conditions (Moffit, 1997).

Moffit's Developmental Taxonomy

Studies from the United States indicate that the rates for prevalence (i.e., the proportion of individuals in the population who engage in a certain behavior) and incidence (i.e., the number of instances of a behavior committed by individuals) of offending are at their highest during the adolescent years (Gottfredson, Sealock, & Koper, 1996; Howell, 1997; Moffit, 1997; US Department of Health and Human Services, 2001). Official crime rates plotted over age show a sharp peak at age 17, followed by a steep decline in young adulthood. This relationship between age and crime appears to hold true for other nations as well, including Sweden, England, Germany and Japan over recent historical periods (Hirschi & Gottfredson, 1983). It is generally believed that this peak reflects a temporary increase in the number of active offenders rather than an accelerated rate of offenses for a small group of criminals (Moffit, 1993). Blumstein and Cohen (1987) found that by the early 20s, the number of offenders decreases by about

50%, and by the age of 28, the decrease is almost 85%, suggesting that a majority of adolescent offenders desist from criminal activity as they grow older.

Moffit (1993) investigated base rates of persistent and temporary antisocial behavior in a cohort of 1,037 children in Dunedin, New Zealand born between1972 and 1973. Participants were rated on measures of antisocial behavior by parents, teachers, and youth themselves. The result showed that a small group of boys, representing approximately 5% of the total sample, could be identified based on ratings of antisocial behavior more than one standard deviation above the average at each of 7 biennial assessments at ages 3, 5, 7, 11, 13, and 15. In contrast to this group, a large proportion of boys, two-thirds of the remaining sample, were rated above average on anti-social measures at only one or two ages or by only one reporting agent, indicating that stability of antisocial behavior significantly varies between these two groups. Based on this research, Moffit argues for two distinct pathways leading to delinquency, an adolescence-limited and a life-course persistent trajectory. Adolescence-limited offenders characteristically lack notable conduct problems in childhood, and show relatively little continuity or consistency in anti-social behavior over time or across situations. This type of offender tends to discontinue involvement in criminal activity once their actions no longer lead to desired outcomes in early adulthood. Moffit submits that the adolescent-limited offender's involvement in anti-social behavior is a reflection of "social mimicry" of early onset peers and that anti-social actions are aimed towards attaining mature status and desirable resources usually reserved for adults (e.g., access to cars, drugs, expensive clothing, and other symbols of status), and that factors contributing to risk associated with this type of offending are centered in domains particularly influential in adolescence, such as negative peer influences and pursuit of independence (Moffit, 1993, 1997).

In contrast to this large group of offenders, a smaller group of individuals, estimated to about 5%, manifest antisocial behavior at an early age in life (Henry, Caspi, Moffit, & Silva, 1996; Moffit, 1993, 1997; Moffit & Caspi, 2001). Longitudinal research on continuity of high levels of physical aggression in a Canadian community sample of 1,161 youth supports this estimate, showing approximately 3% of the sample engaging in high levels of aggression through childhood and adolescence (Brame, Nagin, & Tremblay, 2001). According to Moffit, this small group of offenders is characterized by persistence of problem behavior from childhood through adulthood with different manifestations of problem behavior during different stages of development. Moffit's theory predicts that a life-course persistent pattern of offending is linked to pre-and perinatal conditions and factors associated with adverse child rearing conditions during early childhood. Risk factors associated with a life-course persistent pattern of offending are hypothesized to lie within the domains of individual (e.g., problems in biological, neuro-psychological, cognitive, emotional, personality functioning) and parental characteristics (e.g., parent/child interactions and attachment, parent/sibling deviance, child rearing style, family SES). The persistence of anti-social behavior over time is attributed to that early problem behaviors (e.g., high activity level, aggression, and poor self-control) tend to limit the child's opportunities for learning pro-social behavior during formative developmental stages, and as a result, problem behaviors become increasingly entrenched.

As a function of developmental influences, Moffit (1993, 1997) suggests that the type of crime committed by offenders is likely to differ proportionally. According to this theory, adolescence-limited offenders should engage in a comparatively larger proportion of non-violent crime symbolizing adult privilege and demonstrating autonomy from parental control such as vandalism, public order offenses, substance abuse, running away, and theft. In contrast, life-course persistent offenders should engage in a

wider variety and potentially more serious offenses, including victim-oriented offenses such as fraud and physical and sexual violence. Some empirical support for these hypotheses can be found in the literature. Henry, Caspi, Moffit, and Silva (1996) examined differences in correlates to violent and non-violent offenses in a sample of 1,037 youth in Dunedin, New Zealand and found that youth with a violent conviction by age 18 had more convictions for non-violent offenses ($M = 11$) compared to youth in the nonviolent group ($M = 3$). Furthermore, membership in the violent group was significantly predicted by lack of control in childhood (a factor related to aggression) as measured by ratings by different examiners at age 3 and at age 5. Tolan and Thomas (1995) examined differences between early and late onset offenders in terms of extent and pattern of crime in a U. S. sample of 984 male and female youth. They found that males with an onset of delinquency before age 12 were twice as likely to engage in serious offending compared to those with an onset after age 12. In the female group, onset of offending prior to age 13 was associated with an incidence rate of serious offending seven times that of late onset girls at 3 years post onset, indicating time of onset to be an important predictor of nature of subsequent offending. These results suggest that offenders who engage in serious forms of delinquency tend to have an earlier onset and engage in a wider variety of offending compared to their non-violent peers.

Empirical Evidence of Developmental Changes in Risk

A review of the empirical literature on correlates of delinquency and violence reveal a number of factors pertaining biological, individual, family, and school influences (Gorman-Smith, Tolan, & Henry, 1999; Hawkins et al., 1998; Loeber et al., 2001; Shaw& Winslow, 1997) and there is evidence that suggest that the magnitude of associations is a function of the developmental stage at which they are present. Loeber, Farrington,

Stouthamer-Loeber, and Van Kammen (1998) analysed data from a longitudinal study investigating associations between a number of potential risk factors and co-occurrence of a number of problems including delinquency, substance use, conduct problems, and physical aggression. Among other things, the investigators were interested in risk factors associated with multiple problem outcomes and age shifts in risk factors. The results of the study indicated multiple factors that were significantly related to several problem behaviors, with strengths of associations varying greatly between outcomes. Overall, low academic achievement, lack of guilt, and hyperactivity predicted the largest number of problem behavior outcomes, with lack of guilt being a particularly strong predictor for externalizing behavior such as conduct problems, physical aggression, and delinquency. Although the strengths of associations between risk factors and problem behaviors were generally similar across the three age groups included in the sample, for some outcomes age shifts were found. Presence of shy and withdrawn behavior and low academic achievement were associated with a large number of negative outcomes at a young age. Family factors such as parental deviance, parental substance abuse, and parental behavior problems were more strongly associated with a larger variety of negative outcomes in the younger age sample than in older age samples, suggesting the impact of some risk factors tends to narrow with age. In contrast, other risk factors showed an increase in the strength of association with negative outcomes in the older age sample. Physical punishment and poor supervision were more strongly associated with physical aggression and covert problem behavior when present at an older age. Loeber et al. (1998) did indeed find that that boys with multiple problems were best predicted by risk factors in the individual and family domains, and their findings are congruent with Moffit's emphasis on the importance of family influences on conduct problems developing in childhood. The results of their research seem to indicate that at least in some cases, the

predictive ability of risk factors are a function of the developmental stage at which they are present.

Another study investigating biological, neuro-psychological, psychosocial and individual risk factors and risk markers for delinquency also found evidence to suggest the importance of developmental influences in problem outcomes. Werner (1987) followed a cohort of children born on the island of Kuai in 1955 from birth to young adulthood and found evidence of early predictors for male delinquency at age 18 in three separate domains, including medical variables (presence of a moderate to severe degree of perinatal stress, congenital defects, and acquired physical handicap), sociological variables (low standard of living, low rating of family stability), and behavioral variables (maternal ratings of activity level of infant, need of placement in learning disabled programs or in long term mental health care by age 10). At age 2, the single most powerful predictor for later behavior problems was a low rating of family stability, with additional factors such as low level of maternal education, low standard of living at birth, presence of a congenital defect, and a high activity level rating by the mother contributing to the predictive power. It should be noted that a combination of all the available data at this age resulted in a modest correlation of .32, which is indicative of the difficulties associated with predicting later delinquency at such an early age. By age 10, rates of educational and mental health problems were twice as high as for the cohort as a whole, with the need for remedial education being the strongest predictor of delinquency at this age. Interestingly, the study also found evidence for discriminators between high-risk youth who committed delinquent acts by adolescence and those who did not, which also appeared to be a function of the developmental stage in which they were present. Health, quality of mother-child interaction, and temperament were more important in infancy and during the toddler years, compared to environmental factors

such as the role of the father, mobility of family, parental stress and inter-and intra-personal factors that became increasingly important in childhood and adolescence.

Developmental Risk Factors for Violence

Much attention has focused specifically on identifying risk factors to aid in prevention of violence in adolescents and young adults, and a number of studies have identified factors contributing to risk for future violence (Hawkins et al., 1998; Loeber & Farrington, 1998; Loeber & Hay, 1997; Saner & Ellickson, 1996). Herrenkohl et al. (2000) investigated links between youth violence and predictive factors, and their results indicated four constructs that consistently predicted later violence: hyperactivity, low academic performance, peer delinquency, and availability of drugs. Similar to correlates of general juvenile delinquency, the strength of a factor's correlation to future violence was found to be a function of the developmental stage in which the factor was present. At age 10, anti-social behavior rated by teachers was a particularly strong predictor of future violence. At age 14, predictors including high risk-taking, involvement in selling drugs, early initiation of violence, gang-membership, and presence of neighborhood adults involved in crime tripled the odds for later violence. At age 16, two constructs, drug selling and gang membership quadrupled the odds for violence by age 18. Factors such as hyperactivity, parental attitudes favorable towards violence, and association with delinquent peers doubled the odds for later violence. Additional risk factors that doubled the odds for involvement in violence at age 18 included hyperactivity, child pro-violence attitudes, parental criminality, poor family management, low academic performance, antisocial behavior, peer delinquency, community disorganization, and availability of drugs. Risk factors measured more proximally to violence tended to be stronger than those with longer intervals between the emergence of the risk factor and the outcome of

violence. The study found that the odds for violence at age 18 increased with the number of risk factors to which youth was exposed at each developmental stage (i.e., the results supported an additive model of risk for future violence). Although the investigators were able to predict violent vs. non-violent youth with 80% accuracy based on the data, a large number of individuals were misclassified, which highlights our limited ability to accurately predict future violence. It may be the case that other factors (e.g., biological factors, substance abuse) contribute towards development of aggressive and violent behavior or that protective factors were unaccounted for in this study. These results indicated that significant risk factors for violence can be identified as early as age 10. Furthermore, significant risk factors tended to move from familial and individual factors in childhood toward environmental factors in adolescence, consistent with Moffit's predictions.

Risk Factors Discriminating between Violent and Non-Violent Juvenile Offenders

A few studies have investigated specific early risk factors and risk markers discriminating between violent and non-violent offenders. Kjelsberg (2002) examined the background of 1,276 male adolescents admitted to a hospital in-patient unit in Norway and explored different correlates with a history of violent or non-violent convictions. The results showed that adolescents convicted of violent offenses more frequently had been diagnosed with a disruptive behavior disorder, a concurrent substance use disorder, and poor impulse control. Violent offenders received their first conviction at an earlier age (M = 15.6 yrs) compared to the non-violent group (M = 16.5) and also committed a larger variety of non-violent crimes. Similarly, the last conviction on record for youth in the violent group was committed at a later age, suggesting their criminal careers tended to

span a longer period of time. Furthermore, violent male offenders more frequently had antisocial, criminal or substance abusing parents. The results of this study appear congruent with Moffit's hypotheses about life-course persistent offenders earlier onset of criminal behavior, engagement in a wider variety of criminal activity, longer criminal careers, and strong correlates within the individual and family domains.

Henry et al. (1996) also investigated early correlates of violent and non-violent criminal convictions, focusing on temperament and maternal-familial characteristics. The researchers hypothesized that family factors would be associated with both types of offending whereas serious offending (as defined by a violent conviction before the age of 18) would be predicted by temperamental difficulties in childhood such as an explosive temper and undercontrolled behavior. The study revealed four predictors that significantly discriminated between the three groups included in the sample (no conviction, non-violent convictions, and violent convictions), including lack of control at age 3 and at age 5, number of residence changes, and number of parent changes. Only one variable, lack of control, differentiated between the non-violent and violent conviction group, whereas number of residence and parent changes discriminated the conviction groups from the non-conviction group. These results lend support for the hypothesis that childhood family factors put participants at a general risk for offending and that early childhood temperament is specifically associated with having a violent conviction at age 18. The authors hypothesized that the combination of lack of social regulation *and* self-regulation put early-onset offenders at increased risk for serious and violent offending compared to their non-violent peers.

Others have found no significant difference in correlates of violent offenders and non-violent offenders. Capaldi and Patterson (1996) investigated family background (SES, number of transitions), family management (parental antisocial behavior, drug use, and personality traits) and prepubertal behavior in Grade 4 (antisocial behavior,

drug exploration) in two U.S. samples of 206 boys matched on frequency of arrest by age 18. The results revealed that "none of the contextual, family management or behavioral measures at Grade 4 significantly predicted which boys would be arrested for a violent offense given that they had multiple arrests" (p. 213). Although self-report measures of violent behavior revealed that many offenders in the non-violent group actually committed violent acts at a high rate, only a very small amount of variance was accounted for by two constructs, namely, parent transitions and parental report of covert antisocial behavior in Grade 4.

Assessment of Risk From a Developmental Perspective

Although longitudinal studies have identified specific factors associated with delinquency and violence, we are only beginning to develop knowledge about relationships between specific domains of risk factors and developmental influences on the outcomes of violent and non-violent juvenile delinquency. Use of reliable and valid standardized assessment instruments that tap into a wide range of domains is essential to get a clearer picture of the important factors that predict and protect against emerging violent and delinquent behavior. A limitation to research on juvenile delinquency conducted to date, including those reviewed above, is that they employ a variety of assessment tools in collecting information on risk factors and risk markers. The general quality of research (in terms of replicability of findings and further exploration of additional risk and protective factors) would likely be enhanced by use of a comprehensive instrument specifically developed for this type of research that tap into a wide variety of empirically supported and hypothesized factors (Guerra, 1998). One goal of the present study was to evaluate a new, comprehensive instrument for assessing risk for future violence that is designed to take developmental issues into account.

Present Study

There were two goals for the present study. The first was to investigate the psychometric characteristics of a newly developed risk assessment tool, the Cracow Instrument (CI; Corrado, 2002) and to evaluate its' usefulness in research on delinquency. The CI encompasses 38 risk factors and risk markers in five domains empirically linked to juvenile delinquency and violence, and it is constructed to account for developmental issues. It is divided into five sections, corresponding to developmental stages ranging from the pre- and perinatal stage to adolescence. Specifically, the psychometric properties of the CI to be examined were convergent validity with the Colorado Youth Offender-Level of Supervision Inventory (CYO-LSI; Juvenile Standardized Assessment Committee, 1995) and coding inter-rater reliability of the Adolescence section of the instrument.

A second goal of the present study was to investigate the validity of Moffit's predictions about correlates associated with an early-onset, life-course persistent vs. a late-onset, adolescent- limited patterns of offending. Moffit (2001) designates early onset offenders as those who exhibited evidence of extreme childhood antisocial behavior problems across time (as measured by ratings at at least 3 of 4 assessment occasions) and across situations (as measured by ratings by parents and teachers). Similarly, the present study considered early onset as indicated by evidence of disruptive and antisocial attitudes and behavior in early and middle childhood on items including General Behavior Problems, Violence and Aggression, and General Offending. Moffit's theory suggests that early onset of problem behavior should be associated with more serious, person-oriented offenses in adolescence, and thus, it was predicted that violent offenders, on average, would have an earlier onset of problem behavior in comparison to their non-violent peers.

Risk correlates associated with differences in nature of offending were also investigated. Violent offenders were defined as youth adjudicated of a criminal offense reflecting "actual, attempted, or threatened physical harm of another person" (Corrado, 2002, p. 295). This group included youth adjudicated for offenses such as threat of bodily harm, actual or attempted physical assault, and robbery. Non-violent offenders included youth adjudicated for any offense that did not fit the definition of a violent offense. It was predicted that violent offending should be associated with risk factors and risk markers in the early environmental, individual, and family domains of the CI. In contrast, non-violent offenders were predicted to show a strong correlation with knowledge of peer delinquency and have been subjected to less risk in early developmental periods.

METHOD

Participants

Participants in the study were 80 male youth placed in custody at the Platte Valley Youth Services Center in Greeley, Colorado, a combined assessment, detention and treatment facility operated by the Colorado Division of Youth Correction (DYC). Youth were between 15 and 17 years of age at time of admission, and came from the northeast region of Colorado that include both rural and urban areas. The ethnic background of the sample was primarily Hispanic (n = 35) and Caucasian (n = 40), but also included a small number of youth of African-American (n = 1) and mixed ethnic descent (n = 4). Participants were limited to male adjudicated delinquents in the custody of the Department of Human Services; no detained youth were included in the sample as data was insufficient on youth in this group. Offenses committed by youth in the sample included status-type of offenses (e.g., violation of probation and parole), property offenses (e.g., theft, burglary, vandalism, arson) and person-oriented offenses (e.g., physical assault and robbery).

Procedure

Participants were selected for inclusion in the sample by six criteria: gender, ethnicity, age at admission, date of admission, nature of current offense(s), and nature of prior offense(s). Only male youth, primarily of Caucasian or Hispanic ethnicity, between the ages of 15 years, 0 months and 17 years, 11 months at time of admission between January 1, 2000 to December 31, 2002 were included to minimize variability. The decision to primarily include Caucasian and Hispanic youth in the sample was prompted by the fact that these ethnic groups comprise approximately 91% of Colorado's

population of adolescents (Colorado Department of Public Health and Environment, 1997). Classification of type of offense (current and prior) was guided by the Cormier-Lang System for Quantifying Criminal History (Quinsey, Harris, Rice, & Cormier, 1998; Appendix A). This is a classification system that was developed based on the Criminal Code of Canada but is applicable to the U.S. criminal justice system as criminal statutes in both countries are similar. The authors recommend using the system for the purpose of quantifying offending histories based on official police records. In the present study, the system was only used to guide decisions pertaining to classification of offenses as violent or non-violent and no summary score of an individual's offense was calculated. Given that the operational definition of violence in this study included actual, attempted, and threatened acts of physical harm, some offenses reflecting threats of violence, e.g., Uttering Threats and Harassment, were classified as violent in the present study contrary to their non-violent classification in the Cormier-Lang System. Youth selected for inclusion in the non-violent offender group were screened for a previous history of adjudication for violent offense(s), and only those with no prior history of violent offending were included in the sample. An approximately equal number of offenders having committed violent (n = 35) and non-violent offenses (n = 43) were included in the sample.

Approval for this study was obtained from the Simon Fraser University Office of Research Ethics prior to the beginning of data collection. Data were collected onsite at Platte Valley Youth Services Center by the primary researcher and a research assistant through review of institutional files. No direct contact was initiated with youth or their families. Consent from individual participants in the study was not sought due to logistical difficulties in locating participants and their families. Instead, as commonly is the practice in conducting archival research, consent to access to data was obtained from the Director of Platte Valley Youth Services Center and the Colorado Division of

Youth Corrections Director of Research. In addition to data on risk factors in the five domains of the CI, information on ethnicity, age at current admission, age at first delinquent adjudication, grade level corresponding to age, Reading, Arithmetic, Writing and Knowledge subscores on the Woodcock-Johnson III, full-scale IQ (FSIQ) scores based on the Wechsler Intelligence Scale for Children, the Wechsler Abbreviated scale of Intelligence, the Comprehensive Test of Non-Verbal Intelligence, or the Kaufman Brief Intelligence test, number and nature of current and prior adjudications, subscores on the Colorado Young Offender-Level of Supervision Inventory (CYO-LSI) including Criminal History, Substance Abuse, Education/Employment problems, Family problems, Peer relationship problems, Accommodation problems and Miscellaneous, and total CYO-LSI scores were also recorded. All identifying data was coded numerically to protect participant confidentiality.

A research assistant was employed by the primary researcher to perform cross-codings of CI items on 10 violent and 10 non-violent randomly selected offenders in the sample for inter-rater reliability purposes. An advertisement for the research assistant position was forwarded to contacts at the Departments of Psychology at two local universities, but did not generate any applicants. Therefore, the primary research recruited an acquaintance known to be of good character and with an interest in gaining research experience to perform the cross-codings. The research assistant was a 25-year old, female, recent graduate in Psychology from a local university. Although she had some previous experimental research experience through her undergraduate training, she had no previous experience conducting file review nor did she have prior exposure to the juvenile justice system in Colorado. The research assistant was provided with approximately 4 hours of training on site. The training included an introduction to the purpose of the study, an overview of the organization of the CI, a detailed explanation of items included in the instrument, an explanation of the rating system employed, an

overview of the composition of files and type of information included, and location of specific information pertaining to CI items. She was also provided with a copy of the Cracow Instrument manual as a reference in coding information. Due to time constraints, no criterion ratings between coders were performed.

Measures

The Cracow Instrument (CI)

The Cracow Instrument is a comprehensive instrument developed based on recent research on risk for youth violence and serious juvenile delinquency. It is a risk/needs management tool designed to take developmental issues into account, and intended to help identify youth at risk of developing serious and potentially violent behavior problems and help direct intervention efforts towards risk reduction (Corrado, 2002). The CI is not an actuarial risk prediction tool, i.e., it is not intended to be used for making predictions regarding an individual's probability of engaging in future violence or serious delinquency. The CI encompasses 34 risk factors empirically associated with delinquency and violent behavior in five broad domains (environmental, individual, family, intervention, and disruptive behavior). It is divided into four sections corresponding to the prenatal/perinatal (conception to birth), infancy and toddlerhood (birth to 5 years), middle childhood (6 to 12 years), and youth/adolescence (13 years and up) developmental stages. Examples of items included in the CI are maternal substance use during pregnancy, obstetrical complications, family conflict, early caregiver disruption and parent child attachment, exposure to violence, peer socialization, cognitive delays and disorders, school functioning, accessibility to interventions, and substance use. A complete list of risk items can be found in Table 1.

Table 1. Cracow Instrument Risk Items

ENVIRONMENTAL DOMAIN
Prenatal/Perinatal Complications
Obstetrical Complications
Maternal Substance Use During Pregnancy
Living Conditions
Community Disorganization
Family Socio-economic Status*
Residential Mobility*
Exposure to Violence
Other Influences
Peer Socialization*
School Environment
Other Considerations (Optional)
Exposure to toxins
INDIVIDUAL DOMAIN
Biological
Birth Deficiencies
Parental History of Mental Illness*
Executive Dysfunction*
Chronic Underarousal
Psychological
Cognitive Delays/Disorders
Personality Traits/Disorders*
Other Mental Illnesses
Antisocial Attitudes*
Functional
Poor Coping Ability
School Functioning
Other Considerations (Optional)
Abnormal Biochemical Activity
FAMILY DOMAIN
Parental Characteristics
Teenage Pregnancy*
Maternal/ Parental Coping Ability*
Parental Antisocial Practices/ Attitudes*
Family Dynamics
Familial Supports*
Family Conflict / Domestic Violence*
Sibling Delinquency*
Parent/Child Relationship
Ineffective Parenting*
Early Caregiver Disruption & Parent/Child Attachment*
Other Considerations (Optional)
Parental Education & IQ
Family Structure/Single-Parent Family*

INTERVENTION DOMAIN
Previous Interventions
Accessibility to Interventions*
Familial Responsivity to Intervention*
Child/Youth Responsivity to Intervention
Other Considerations
EXTERNALIZING BEHAVIORS DOMAIN
General Behavioral Problems
Violence and Aggression*
Substance Use*
General Offending
Other Considerations

* items with less than 25% of sample data missing

Each section of the CI includes all risk factors from previous sections in the developmental sequence, along with added risk factors relevant to the specific developmental stage at which the child is being evaluated. For example, the middle childhood section of the instrument includes all risk factors in the prenatal/perinatal and early childhood sections, and risk factors associated with development in middle childhood are added. Constructs/items are coded for presence at each developmental stage and subsequently rated for severity based on the pervasiveness of the factor up to the current developmental period. An item is coded "0" if the item is definitely absent, "1" if the item possibly is present, or present to a limited extent, and "2" if the item is definitely present. If information about an item is inadequate, of questionable validity, or missing altogether, it is omitted.

Colorado Young Offender–Level of Supervision Inventory (CYO-LSI)

The CYO-LSI is an 84-item quantitative, semi-structured interview schedule based on the Young Offender-Level of Supervision Inventory (YO-LSI; Shields & Simourd, 1991) that measures criminal history, substance abuse, education/employment history, family, peer relations, accommodations, and miscellaneous variables (Appendix B). This measure was developed for use by the Colorado Division of Youth Corrections

for the purpose of assessing needs of young offenders relevant to services and supervision. Research on the CYO-LSI has found that it measures "a propensity to violate rules" (p. 1, Juvenile Standardized Assessment Committee, 1995) and has been found to correlate with delinquency, recidivism, institutional misconduct, and predatory behavior. Research has demonstrated that the psychometric properties of the he parent instrument, the YO-LSI, are good. In a matched sample of 82 male and female young offenders, higher scores on the inventory were associated with clear increases in recidivism rates at one year post-release from custody for both male and female participants (Ilacqua, Coulson, Lombardo, & Nutbrown, 1999). Shields and Simourd (1991) also used the YO-LSI in a sample of 254 incarcerated male and female young offenders, and found that the instrument had high interrater reliability (97% between two raters) and good discriminant validity in identifying predatory offenders, i.e., those who were prone to seek exploitative relationships with incarcerated peers from non-predatory offenders (88% and 82% correctly identified respectively).

RESULTS

Descriptive Data

Two participants in the non-violent group had prior adjudications for violent offenses and therefore had to be eliminated, leaving 78 participants in the sample. The mean age at time of admission for youth included in the study was 16.71 (*SD* = .83) and participants had an average of 2.9 offenses prior to their current adjudication. A majority was Caucasian (48.7%, *n* = 38) or Hispanic (44.9%, *n* = 35), followed by mixed ethnicity (5.1%, *n* = 4) and African-American (1.3%, *n* = 1). The mean FSIQ for youth with available data (*n* = 66) was 93. There were an approximately equal number of participants in the violent (44.9%, *n* = 35) and non-violent (55.1%, *n* = 43) groups. A list of the range of the nature and frequency of offenses for the violent and non-violent groups can be found in Table 2 and Table 3 respectively.

Table 2: Frequency of Violent Offenses

Offense	Frequency
Aggravated Robbery	1
1° Assault	3
2° Assault	4
3° Assault	15
Harassment–Strike, Shove, Kick	4
Harassment-Telephone Threat	2
1° Kidnapping	1
Menacing	8
Menacing with a Weapon	2

Table 3: Frequency of Non-Violent Offenses

Offense	Frequency
1° Aggravated Motor Vehicle Theft	4
2° Aggravated Motor Vehicle Theft	5
2° Arson	1
Attempted 2° Arson	1
1° Burglary	1
2° Burglary	5
3° Burglary	1
Carrying a Concealed Weapon	1
Criminal Impersonation	1
Criminal Mischief	4
Defacing Property	1
Escape from Pending Felony	1
Harassment	1
Interference with School Staff	2
Obstruction of Peace Officer	1
Poss./Consumption of Alcohol by Minor	1
Poss. of Controlled Substance	3
Poss. of Marijuana > 1 oz	2
Marijuana Distribution	1
Possession of Handgun	1
Poss. of 2 or more Financial Transaction devices	1
3° Trespass	3
1° Trespass-Auto	8
1° Trespass-Dwelling	6
Theft	7
Theft Under	4
Theft by Receiving	4
Vehicular Eluding	1

Independent sample's t-tests revealed no statistically significant differences in ethnicity, $t(76) = .503$, $p > .05$, (violent group $M = 1.71$, $SD = .86$; non-violent group $M = 1.63$, $SD = .66$) or number of prior offenses, $t(76) = .515$, $p > .05$, (violent group $M = 2.91$, $SD = 2.45$; non-violent group $M = 2.88$, $SD = 2.74$). A significant difference was however found in FSIQ, $t(64) = -2.17$, $p < .05$, with an average difference of 6 IQ points between the violent ($n = 31$, $M = 89.13$, $SD = 12.56$) and the non-violent ($n = 35$, $M = 95.60$, $SD = 11.63$) groups. Only a small percentage of youth had a first adjudication

prior to age 13 (n = 10, 12.8%) compared to the group of youth with a first adjudication at or after age 13 (n = 68, 87.2%).

Missing Data

There was a large amount of missing information in the data set. Only items in the Adolescence section with less than 25% of missing data were considered in subsequent analyses. Twenty items met this criterion and are listed in Table 1. The Environmental domain included three items: Family Socio-economic Status (23% missing data) Residential Mobility (11.5%), and Peer Socialization (4.9%). The Individual domain included four items: Parental History of Mental Illness (18%), Executive Dysfunction (14.8%), Personality Traits/Disorders (23%), and Antisocial Attitudes (9.8%). In the Family domain, the number of items with sufficient data was a bit higher with nine items containing less than 25% missing data: Teenage Pregnancy (18%), Maternal/Parental Coping Ability (21.3%), Parental Antisocial Practices/Attitudes (16.4%), Familial Supports (23%), Family Conflict/Domestic Violence (1.6%), Sibling Delinquency (18%), Ineffective Parenting (1.6%), Early Caregiver Disruption (3.3%) & Parental/Child Attachment (1.6%), and Family Structure (16.4%) & Single Parent Family (18%). The Intervention domain and Externalizing Behavior domain contained two items each: Accessibility to Intervention (11.5%) and Familial Responsivity to Intervention (21.3%) and Violence and Aggression (3.3%) and Substance Use (1.6%) respectively. Missing data for other items across developmental periods ranged between 28% and 100%, with only three items from developmental periods prior to adolescence containing a sufficient amount of data: Early Caregiver Disruption & Parent/Child Attachment in middle childhood (14.8% and 13.1%) and early childhood (14.8% and 16.4%), Family

Structure/Single-Parent Family in middle childhood (19.7%), and Substance Use in middle childhood (14.8%). Given the amount of missing data, a meaningful composite domain score could not be constructed. Furthermore, lack of sufficient early and middle childhood ratings on Antisocial Attitudes, General Behavior Problems, Violence and Aggression, and General Offending prevented classification offenders as early onset in a fashion comparable to Moffit's taxonomy.

Interrater Reliability

Inter-rater reliability of the Adolescence section of the Cracow Instrument was assessed to explore the extent to which coders agreed on ratings of items. Two raters independently coded items on the CI for 20 randomly selected participants, corresponding to 26% of the total sample. First, crosstabulations for each item included in the instrument was calculated. Results indicated that raters agreed on two-thirds of all items in terms of whether it was given a rating (0, 1, or 2) or whether it was omitted. However, calculation of kappa coefficients indicated that agreement between the two raters was not above chance for most of the items in the Adolescent section considered for analysis, with the exception of 4 items including Family SES (.494, $p < .05$), Executive Dysfunction (.579, $p < .05$), Teenage Pregnancy (.737, $p < .01$), and Family Responsivity to Intervention (.468, $p < .05$). When only actual ratings of the 20 items in the Adolescent section were considered (i.e., omitted items were ignored), 4 items contained ratings for at least 75% ($n = 15$) of the subsample: Peer Socialization, Antisocial Attitudes, Violence and Aggression, and Substance Use. Intraclass correlations (ICCs) for these items were computed to assess inter-rater reliability of those items. This analysis yielded the following intraclass correlations: Peer Socialization, $r(19) = .41$, $p < .05$, CI = 95% $.0072 < r < .7107$; Antisocial Attitudes, $r(16)$

= .590, $p < .05$, CI = 95% .173 < r < .829; Violence and Aggression, $r(15) = .211$, $p > .05$, CI = 95% -.140 < r < .580; and Substance Use, $r(15) = .602$, $p < .05$, CI = 95% .164 < r < .841.

Convergent Validity of CI with CYO-LSI

Convergent validity of the Cracow Instrument was originally intended to be investigated by correlating subscores on the CYO-LSI with domain scores on the CI. However, the amount and pattern of missing data in the sample prevented creation of meaningful domain scores on the CI. Thus, convergent validity could not be evaluated using the current data.

Predictions Regarding Early vs. Late Onset Delinquency and Type of Offending

Moffit's theory predicts that early onset of problem behavior should be associated with more serious, person-oriented offenses in adolescence. Given the dearth of data on items indicating externalizing behavior problems in early and middle childhood, an analysis of type of offense in adolescence and age of onset of antisocial behavior problems could not be supported. A comparison of the means for age of first delinquent adjudication of the violent and non-violent groups revealed no difference between these groups (violent group $M = 13.86$, $SD = 1.22$; non-violent group $M = 14.07$, $SD = 1.42$), $t(74) = .74$, $p > .05$. Furthermore, only 40% ($n = 4$) of offenders with a first adjudication before age 13 were committed for a violent offense. It is important to note that the number of offenders with a first adjudication at or prior to age 13 was very small ($n = 10$), which significantly limits the inferences one can draw from these results.

Correlates of Violent vs. Non-Violent Offending

Risk correlates associated with differences in nature of offending were also investigated. It was predicted that violent offending should be associated with risk factors and risk markers in the environmental, individual, and family domains of the CI. In contrast, non-violent offending was predicted to show a strong correlation with peer relationships and peer socialization. Point biserial correlation coefficients were calculated to explore the relationship between types of offending and ratings on CI items selected for analysis with reasonable interrater reliability. The results showed that youth in the violent group tended to have more problems in Violence and Aggression, $r_{pb}(72) = -.504$, $p < .01$, whereas youth in the non-violent group had more problems with Substance Use, $r_{pb}(75) = .276$, $p < .05$. When excluding the 13 % ($n = 6$) of the non-violent subsample with a current adjudication for a substance use related offense, results still indicated a significant correlation between substance abuse and non-violent offending, $r_{pb}(70) = .259$, $p < .05$. However, when participants in the non-violent group with either a current or past adjudication for substance abuse ($n = 12$, 30%) were excluded from the analysis, there was no evidence to support a significant correlation between substance abuse and non-violent offending, $r_{pb}(65) = .209$, $p > .05$. No evidence was found to support a significant association between non-violent offending and Peer Socialization as predicted by Moffit's theory, $r_{pb}(72) = -.18$, $p > .05$.

Differences in scores on the CYO-LSI were also investigated. Ignoring family-wise error, an independent sample's t-test revealed a significant difference, $t(73) = 2.16$, $p < .05$, in the mean Accommodation subscore with the violent group ($M = .82$, $SD = 1.14$) having more problems in this category compared to the non-violent groups ($M = .39$, $SD = .542$). No other significant differences were found in subscores on the CYO-LSI between violent and non-violent offenders.

A logistic regression analysis was employed to predict the probability that a participant would be classified as a violent offender. The predictor variables were participant's FSIQ, subscores on the CYO-LSI including Criminal History, Substance Abuse, Education/Employment Problems, Family Problems, Peer Relationship Problems, Accommodation Problems, and Miscellaneous, total CYO-LSI score, and three items from the CI including Peer Socialization, Antisocial Attitudes, and Substance Use. The CI items were chosen based on the size of the Intraclass correlations and only items with 95% confidence interval upper limits above .70 were included. Logistic regression was chosen over discriminant function analysis, as the effects of continuous and categorical variables were evaluated simultaneously. Results indicated that the sample data fit a logistic regression analysis as the Hosmer-Lemeshow test was non-significant, χ^2 (7, N = 55) = 8.29, p > .05. An omnibus test of the full model versus a constant only-model was statistically significant, χ^2 (12, N = 55) = 35.76, p < .00, suggesting that one or more regression coefficients included in the model were significantly different from 0. That is, the current combination of predictors improved prediction of type of offense compared to a model using only the constant. The model was able to correctly classify 87% of non-violent offenders (n = 30) and 80% of violent offenders (n = 25), with an overall success rate of 84% in the sample. Table 4 shows the logistic regression coefficients, standard error, Wald test, and odds ratio for each of the predictors. Using an alpha of .05 for statistical significance, Criminal History, Education/Employment Problems, Family Problems, Accommodation Problems, Miscellaneous, total CYO-LSI score, and Peer Socialization had significant partial effects.

Table 4: Logistic Regression Predicting Violent vs. Non-Violent Offending

Predictor	β	S.E.	Wald χ^2	Significance.	Odds Ratio
FSIQ	-.00	.05	.00	1.00	1.00
Criminal History	-2.95	1.26	5.44	.02	.05
Substance Abuse	-1.90	1.11	2.93	.09	.15
Education/Employment	-3.39	1.62	4.38	.04	.03
Family Problems	-2.81	1.22	5.29	.02	.06
Peer Relationships	-1.77	.99	3.20	.07	.17
Accommodation	-3.75	1.72	4.77	.03	.02
Miscellaneous	-1.99	.99	4.01	.05	.14
CYO-LSI total	2.33	1.12	4.30	.04	10.27
Peer Socialization	-4.43	1.88	5.53	.02	.01
Antisocial Attitudes	1.92	1.28	2.23	.14	6.81
Substance Use	-.13	.96	.02	.89	.88
Constant	11.15	7.99	1.95	.16	69185.14

As a model with too many predictors is likely to perform poorly when applied to a new sample (i.e., model is "overfitted"), efforts were made to find a good model with fewer predictors. To do so, a forward stepwise procedure was employed. This procedure first enters the variable with the strongest simple correlation with the dependent variable and subsequently enters the variables with the strongest partial correlation in steps until an established criterion is met (in this particular case, once the parameter estimate is changed by less than .001). The procedure resulted in a model with four predictor variables including Accommodation Problems, Criminal History, Peer Relationship Problems, and Peer Socialization. An omnibus test of the model was statistically significant, $\chi^2(4, N = 54) = 17.62$, $p < .01$, and the logistic regression coefficient, standard error, Wald test, and odds ratio for each of these predictors can be found in Table 5.

Table 5. Logistic Regression Predicting Violent vs. Non-Violent Offending.

Predictor	β	S.E.	Wald χ^2	Significance	Odds ratio
Criminal History	-.36	.18	4.09	.04	.70
Peer Relationships	.34	.17	4.02	.05	1.40
Accommodation	-1.00	.43	5.41	.02	.36
Peer Socialization	-1.99	.83	5.73	.02	.14
Constant	4.10	1.68	5.93	.12	60.29

All four predictors were significant at the .05 level, indicating that each predictor in the model contributed the overall accuracy of prediction in this sample. Increases in Criminal History, Accommodation Problems, and Peer Socialization were associated with an increase in odds of being in the violent group, whereas problems in Peer Relationships were associated with increased odds for being in the non-violent group. Overall, this model correctly classified 78% of participants in the sample with 68% and 86% correct classification of violent ($n = 25$) and non-violent ($n = 29$) participants respectively. It should be noted that although the Hosmer-Lemeshow test was non-significant, $\chi^2 (8, N = 54) = 8.505$, $p > .05$, it was approaching significance, suggesting that a logistic regression may not be the most appropriate analysis using this data sample.

A logistic regression was also used to evaluate the predictive ability of the CYO-LSI subscores and total score alone. Although the omnibus test was statistically significant, $\chi^2 (8, N = 77) = 22.173$, $p < .01$, this model did a poorer job at classification in comparison with the reduced number of predictor model described above, with an overall correct classification rate of 74% and with 71% correct classification of violent ($n = 34$) and 77% correct classification of non-violent ($n = 43$) participants. Three predictors were significant at the .05 level: Criminal History, Family Problems, and Accommodation Problems. Logistic regression coefficients, standard error, Wald test, and odds ratio for each of the predictors can be found in Table 6.

Table 6. Logistic Regression Predicting violent vs. non-violent offending.

Predictor	β	S.E.	Wald χ^2	Significance	Odds ratio
Criminal History	-1.07	.50	4.66	.03	.34
Substance Abuse	-.47	.51	.86	.35	.63
Education/Employment	-.91	.53	2.95	.09	.40
Family Problems	-1.12	.51	4.84	.03	.33
Peer Relationships	-.72	.49	2.12	.15	.49
Accommodation	-1.20	.57	4.54	.03	.30
Miscellaneous	-.72	.49	2.12	.15	.79
CYO-LSI total	.78	.48	2.60	.11	2.17
Constant	3.49	1.64	4.54	.03	32.75

DISCUSSION

The original purpose of the current study was to explore the psychometric properties of the Cracow Instrument and to investigate Moffit's predictions regarding correlates of early vs. late onset and violent vs. non-violent offending. However, data analyses were limited by the large amount of missing data and by lack of established interrater reliability for a majority of items on the CI.

One reason for the amount of missing data is that the CI does not appear to be well suited for use in a retrospective, archival research design. First, presence of risk factors/markers during early developmental periods were difficult to discern from the records used in the study as a majority of information focused on problems and risks in adolescence. The limited amount of information pertaining to early developmental periods may in part be due to that diagnosticians responsible for conducting intake assessments have fairly limited resources. Although information is consistently requested from other agencies such as probation, social services, and previous treatment providers during the 30-day intake assessment period, information cannot always be obtained. It is also likely the case that diagnosticians do not have ready access to information on specific distal risk factors, such as obstetrical complications, birth deficiencies, and community disorganization; hence, information on these items are not typically found in reports. Yet other items may not be considered relevant to the specific purpose of the assessment. For example, an item like Chronic Underarousal that requires physiological measurements of heart rate, skin conductance, or by electroencephalogram (EEG) is likely considered too specific of a risk marker to have any real clinical importance in these types of assessments. Finally, given the inherent involuntary nature of an assessment upon commitment to DYC, it may be difficult for diagnosticians to obtain adequate cooperation and reliable information from youth and

their families on exposure to risk factors. Generating information pertaining to factors that may be perceived to reflect poorly on the family or the parents of a youth (e.g., Exposure to Violence, Parental History of Mental Illness, Parental Antisocial Practices/Attitudes, and Ineffective Parenting) may be particularly difficult, especially in the Hispanic culture where family and community are strongly held value.

Another major limitation was the low interrater reliability of ratings on the CI. The poor reliability of ratings is likely due to a number of factors. First, the primary researcher had more exposure and greater familiarity with contents of records and the meaning of psychological and educational test data given a graduate training in psychopathology, interpretation of assessment tools and prior employment at the facility. Although, the research assistant held a bachelor's degree in psychology from the University of Northern Colorado and had some prior research experience, she lacked prior training or knowledge pertaining to the juvenile criminal justice system, interpretation of psychological assessment data, or exposure to contents of criminal records. This likely made it more difficult to locate and to identify specific types of relevant information within the records. Second, the research assistant was not provided sufficient training on coding the CI. Attempts to recruit a qualified research assistant occurred during the summer semester when a fewer number of qualified candidates were available and therefore the hiring process of an assistant took longer than anticipated. Time and financial constraints prevented the coders from practicing and comparing codings, and as no criterion coding was performed, this likely accounted for a substantial amount of variability in ratings. Finally, the relatively small number of files coded by both raters may also have contributed to the failure to establish interrater reliability.

Investigation of Moffit's predictions regarding associations between early vs. late onset of antisocial behavior and type of offending could not be supported by the data in the present study. No valid conclusions could be drawn regarding differences in

correlates between early or late onset types of antisocial behavior in this sample given the lack of information on early externalizing problems. Descriptive data on early onset as defined by age of first adjudication should be interpreted with extreme caution. First, the number of offenders who had a delinquent adjudication before age 13 was very small (n = 10). It is relatively rare that youth are committed to DYC at such an early age. Many jurisdictions favor placement of delinquent pre-teens with Social Services agencies as those types of placements are typically considered a more appropriate intervention by juvenile courts at such an early age. Though efforts are routinely made to obtain information from previous placements on youth entering the DYC system exchange of information is not always as smooth and seamless as ideally would be the case. Thus, information pertaining to early delinquent activity that resulted in interventions outside of the juvenile justice system was not consistently available in records used in this study. It should be noted, however, that over the past few years, a state-wide comprehensive database system for multi-agency use has been developed and is in its' initial stages of implementation in Colorado. This system is intended to streamline and facilitate information flow between agencies servicing youth and their families, and once fully implemented, should greatly facilitate exchange and access to information. Also, age at time of first delinquent adjudication was not used as a selection criterion for participant inclusion in this study, which may have contributed to the limited subsample.

Some methodological concerns regarding using age at first adjudication in distinguishing early onset offenders from late onset offenders in an adolescent sample are also worth noting. Loeber and Stouthamer-Loeber (1998) have argued that early onset cases can *only* be distinguished from late onset cases by taking behavioral histories. This implies that data on age of first criminal adjudication provides insufficient information regarding onset of delinquency. Although it may seem reasonable to assume

that children with an onset of behavior problems in early and middle childhood would be more likely to enter the juvenile system at an earlier age compared to their adolescent onset peers, this is an empirical question in need of further examination. Furthermore, Moffit (1993) has argued that adolescent samples are generally not the best group to study in regards to correlates of early onset, life-course persistent offending patterns as this group will largely be attenuated by the increase in numbers of adolescent limited offenders.

The results pertaining to correlates of violent vs. non-violent offending are perhaps the most interesting findings of the present study, as in some aspects they appear congruent, albeit to a limited extent, with Moffit's predictions regarding associations between type and severity of offending and specific areas of risk correlates. The obtained results suggest a small but significant association between non-violent offending and Substance Use as measured by the CI, even when participants with a current adjudication for substance use related offenses were excluded from the sample. This appears to lend some support for an association between this type of offending and an activity that could be interpreted in terms of a desire to obtain mature status. Interestingly, no difference was found between the two groups on the Substance Abuse subscore on the CYO-LSI. Although this may seem contradictory, it is perhaps due to the fact that the CI focuses simply on the use of substances, whereas the CYO-LSI item is more oriented towards severe, abusive aspects of substance use. Lipsey and Derzon (1998) demonstrated that substance use in adolescence only had a small effect size in prediction of subsequent violence and offending that could account for the current findings. More research is clearly needed to establish the extent of convergent validity between these constructs on the CI and CYO-LSI.

Another interesting finding is the difference found in FSIQ, with the violent offender group having an average of 6 IQ point lower than the average for the non-

violent group. Dodge and Schwartz (1997) have suggested that social information-processing patterns (encoding, interpretation, goal selection, response access and response construction, and response decision) is an important mediating factor between environmental triggers and children's aggressive behavior, and that such processing in part is related to general intelligence. The difference in IQ reflected in the current results may be interpreted in terms of deficits in violent offenders ability to efficiently attend to and interpret relevant social information that contribute to responding to social stimuli with violent behavior. One could argue that this interpretation support Moffit's prediction regarding associations between serious, violent offending and the importance of risk correlates in the individual domain.

Comparisons between violent and non-violent offenders on their scores on the CYO-LSI revealed a significant difference in accommodation problems, with evidence suggesting that violent offenders had experienced a greater amount of disruption in their housing situation across their lifetime compared to non-violent offenders in the sample. Again, this evidence appears congruent with Moffit's prediction of risk correlates for serious offending patterns in adverse childrearing conditions, and also fits well with Capaldi and Patterson's (1996) finding of a small association between parental transitions and self-reported violent behavior.

The results of an exploratory analysis investigating predictors of violent vs. non-violent offending indicated that a model combining three CYO-LSI items and one CI item (Criminal History, Accommodation Problems, Peer Relationship Problems, and Peer Socialization) did an adequate job at accurate classification of offenders. It is important to understand that this combination was derived from an arbitrary, atheoretical combination of predictors chosen for inclusion based on amount of available data and interrater reliability and that the model represents only one of many possible combinations of the same predictors. Hence, although this model appears to do an

adequate job at prediction, no claims can be made that this is the only nor the "best" model for prediction of type of offense based on the current data. Furthermore, crossvalidation using a different sample is needed to increase our confidence in the predictive ability of this particular subset of variables. This can be accomplished by a statistical procedure called Jack-knifed classification that offers a more realistic estimate of the predictive ability of a particular model to separate groups (Tabachnick & Fidell, 2001).

In regards to Moffit's prediction about knowledge of peer delinquency in adolescence and non-violent offending, there was no consistent evidence in this study to support the notion that it is strongly associated with less severe forms of offending (i.e., non-violent offending patterns). There could be at least two different explanations for these results. First, it may be a reflection of a possibility that neither measure used in this study were psychometrically sound, which would in effect hide a true association between non-violent offending and knowledge of peer delinquency. Alternatively, it may be the case that knowledge of peer delinquency is not reliably associated with non-violent offending in adolescence. Loeber and Stouthamer-Loeber (1998) have argued for a small but significant group that suggests there is a third trajectory of antisocial behavior that is characterized by late onset of violent behavior in adolescence. Given the demonstrated importance of peer influences during adolescence, it is plausible that such influences may present a contributing factor to development of violent behavior in this group of offenders. To date, little is known about the correlates of this type of offender. It should be noted that knowledge of peer delinquency could not be interpreted as a non-significant correlate of adolescence-limited offending based on the present data. It does, however, suggest that adolescence-limited offending is not necessarily limited to non-violent offending. More research is needed to determine correlates of this small group of offenders.

It is recommended that future research on the Cracow Instrument adopt a prospective, longitudinal research design as this tool does not appear well suited for retrospective, archival research. Such a design would better be able to obtain data on risk factors and risk markers in the environmental, individual, and family domains. Furthermore, additional research is needed to evaluate the psychometric properties, including interrater reliability and convergent validity with other, similar risk/needs assessment instrument before the CI can be reliably used for research purposes. A larger sample of participants is also needed in order to obtain statistically sound results.

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APPENDICES

Appendix A:

Cormier-Lang System for Quantifying Criminal History

GROUP 1 (Violent Offenses)
Homicide (murder, manslaughter, criminal negligence causing death)
Attempted murder, causing bodily harm with intent to wound
Kidnapping, abduction, and forcible confinement
Aggravated assault, choking, administering a noxious thing
Assault causing bodily harm
Assault with a weapon
Assault, assaulting a peace officer
Aggravated sexual assault, sexual assault causing bodily harm
Sexual assault with weapon
Sexual assault, gross indecency (vaginal or anal penetration; victim forced to fellate offender)
Sexual assault (attempted rape, indecent assault)
Gross indecency (offender fellates or performs cunnilingus on victim)
Sexual assault (sexual interference, invitation to sexual touching)
Armed robbery (bank, store)
Robbery with violence
Armed robbery (not a bank or store

GROUP 2 (Non-Violent Offenses)
Robbery (bank, store)
Robbery (purse snatching)
Arson and fire setting (church, house, barn)
Arson and fire setting (garbage can)
Threatening with a weapon
Threatening (uttering threats)
Theft over (includes car theft and possession of stolen property over)
Mischief to public or private property over
Break and enter and commit an indictable offense (burglary)
Theft under (includes possession of stolen goods under)
Mischief to public or private property under (includes public mischief)
Break and enter (includes breaking and entering with intent to commit an offense)
Fraud (extortion, embezzlement)
Possession of a prohibited or restricted weapon
Procuring a person for, or living on the avails of prostitution
Trafficking in narcotics
Dangerous driving, impaired driving (driving while intoxicated)
Obstructing peace officer (including resisting arrest)
Causing a disturbance
Wearing a disguise with the intent to commit an offense

Appendix B:

Colorado Young Offender-Level of Supervision Inventory

CRIMINAL HISTORY
1.___Three or more present offenses
2.___Current offense occurred during supervision
Ever been charged or adjudicated for:
3.___Weapons offense(s)
4.___Vandalism/Mischief
5.___Burglary
6.___Assault/Violence
7.___Armed Robbery
8.___Trespassing/Loitering
9.___Shoplifting
10.__Sexual Offense/Misconduct
11.__Theft (misdemeanor or felony)
12.__Possession of stolen goods
13.__Forgery/Fraud
14.__Probation/Parole revocation
15.__Two or more prior adjudications
16.__Arrested under age of 16
17.__Prior sentenced incarceration
CRIMINAL HISTORY SUBTOTAL___/17

SUBSTANCE ABUSE
18.__Uses tobacco
19.__Regular use of alcohol
20.__Alcohol abuse
21.__Regular use of marijuana
22.__Has used mood-altering (non-ETOH) substances
23.__Regular use of other substances
24.__Substance use interferes with daily functioning
25.__Crimes due to poor judgment while under influence of drugs or alcohol
26.__Crimes to support/obtain drugs/alcohol
27.__Charged for any drug offense
SUBSTANCE ABUSE SUBTOTAL___/10

EDUCATION/EMPLOYMENT PROBLEMS
28.__Not participating in education program
29.__School achievement
30.__Has repeated a grade
31.__Truant when enrolled in last year
32.__Classroom behavior last year
33.__Relations with student peers/co-workers
34.__Relations with teachers/supervisors
35.__Suspended or expelled from school
36.__Cannot read at newspaper level
37.__Has never been employed
38.__Has been fired
EDUC/EMPLOYMENT SUBTOTAL___/11

FAMILY PROBLEMS
39.__Relations with (step) mother
40.__Relations with (step) father
41.__Poor relations with siblings
42.__Parental supervision
43.__Often away from home
44.__Has been in out-of-home placement
45.__Sibling have been in group home
46.__Criminal history: father, mother, sibs
47.__Psychiatric history: father, mother, sibs
48.__Substance abuse: father, mother, sibs
49.__Receives social assistance
50.__Has been victim of physical abuse by person in a position of trust
51.__Sexual abuse
52.__Primarily raised in a single parent home
53.__Chaotic family
FAMILY PROBLEMS SUBTOTAL___/15

PEER RELATIONSHIP PROBLEMS
54.__Could make better use of time
55.__No pro-social interests
56.__Peers outside age range
57.__Has very few pro-social acquaintances
58.__Has very few pro-social friends
59.__Has criminal acquaintances
60.__Has criminal friends
61.__Allegiance to criminal peers
62.__Has gang affiliation
63.__Socially isolated
64.__Is promiscuous
65.__Has sexual experience
66.__Is unconcerned with birth control
67.__Has children
PEER PROBLEMS SUBTOTAL___/14

ACCOMODATION PROBLEMS
68.__Lives away from parents/guardians
69.__Frequent address changes
70.__Housing problems
71.__High crime neighborhood
ACCOMODATION SUBTOTAL___4

MISCELLANEOUS
72.__Has tattoos or past self mutilation

73.__Experienced significant loss
74.__History of psychological intervention
75.__Attempted suicide prior to past year
76.__Suicide interest
77.__Fire-setting patterns
78.__Intellectual disorder/past severe headtrauma
79.__Poor attitude towards sentence/disposition
80.__Supportive of delinquency
81.__Intends to continue crime
82.__Absence of reasonable future plans
83.__Belligerent during interview
84.__Psychological intervention recommended

MISCELLANEOUS SUBTOTAL___/13

CYO-LSI TOTAL SCORE=_____