GENDER DIFFERENCES IN ADOLESCENT VIOLENT CRIME: A Multifactorial Approach

by

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We accept this dissertation as conforming to the required standard

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ABSTRACT

Gender differences in violent and nonviolent young offenders were investigated in a sample of predominantly white females (48 nonviolent and 35 violent) and males (49 nonviolent and 35 violent). Subjects were compared on a variety of biological, family adversity, intelligence, achievement, and personality variables. The results indicated that, overall, females came from more abusive family environments and were placed in significantly more foster or group homes than males. They were also less psychologically well-adjusted than males and scored lower on psychometric intelligence and academic achievement measures.

Violent offenders, independent of gender, showed higher levels of physical abuse, witnessed more family violence, and came from lower SES backgrounds than nonviolent offenders. An unexpected finding was obtained for the violent versus nonviolent offenders, in that the violent offenders were, on average, higher in psychometric intelligence than nonviolent offenders.

Structural equation modelling revealed two types of offenders: rebellious (externalizing) violent offenders and socially withdrawn (internalizing) nonviolent offenders. These two categories of offender type were found for both sexes. Analyses further indicated that the withdrawn nonviolent offender type showed a higher proportion of negative outcomes on the variables used for study (e.g., adverse family environment, lower intelligence and academic achievement, and greater overall personality pathology). Conversely, the rebellious, violent offenders tended to show a combination of negative and positive outcomes (e.g., adverse family environment combined with higher intelligence

and school achievement).

The results were discussed within the context of psychosocial and sex role theories of violence and delinquency. Treatment implications for young offenders based on the findings and directions for future research were also addressed.

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CHAPTER I

INTRODUCTION

Numerous studies report that violent crime has increased in adult (e.g., Monahan, 1981) and adolescent offender populations (e.g., Inamdar et al., 1986; Wolfgang, 1978). Statistics Canada shows that even in a single year (1992-1993) the number of court cases involving violent youth between the ages of 12 and 17 increased by nine percent (The Canadian Press, 1993).

Of particular interest to the present research is the fact that the number of crimes committed by women is increasing at a faster rate than crime by men (Widom, 1978). Studies have also reported an increase in violent crimes committed by females under the age of 18 (e.g., Balthazar & Cook, 1984; Burquest, 1981). Inamdar et al. (1986) found that in their sample of hospitalized adolescents with psychiatric disorders, females sampled in the late 1970s were significantly more violent than those sampled in the late 1960s. To date, relatively few studies have focused on environmental and psychological characteristics of female offenders, particularly within the adolescent population. Additionally, males and females who commit violent crimes are rarely compared, regardless of age category. The purpose of the present research was to investigate gender differences on a variety of dimensions in those young

offenders who commit violent versus nonviolent crimes. The next section will briefly discuss general theories of delinquency and violence, then focus more specifically on theories of female violence.

Psychosocial/Environmental Theories of Violence

Strain and Subculture: According to strain theories of delinquency, lower class youth experience a discrepancy (or strain) between culturally defined goals for success and means of reaching these goals in a legitimate manner. Existing social structure provides different educational and occupational opportunities for attaining success for youth from lower versus higher social classes (Nettler, 1984). In terms of violent crimes, one could speculate that the frustration resulting from the strain of not attaining goals and therefore feeling unsuccessful, may lead some individuals to act out in an aggressive manner.

Subculture theories emphasize that some groups retain different cultural norms and values, which may be conflictual with those of the majority (Wolfgang & Ferracuti, 1982). Violent behavior in adolescence reflects the acceptance of violence as a viable characteristic of their particular subculture, which is most often within the lower socioeconomic segment of society.

Differential Association Learning and Social Learning Theories: Differential association learning theory states

that delinquency is facilitated, imitated, and internalized through modelling and social reinforcements within small groups (Sutherland & Cressey, 1978). Again, as with subculture theories of violence, violent behavior may be sanctioned within certain groups.

According to social learning theory, violent individuals have witnessed or been the recipient of violent acts in their homes and have incorporated such behavior into their own lives via modelling and imitation (Bandura & Walters, 1959). This theory is supported by studies that show that violent youth are more likely than nonviolent youth to have been physically abused and/or witnessed assaultive behavior in the home (see Quay, 1987 for a review of this literature). Thus, increases in the numbers of violent crimes committed by adolescents may reflect an increase in the nature and extent of family violence in contemporary society.

Satellization and Social Control Theories: Satellization theory (Berzonsky, 1978) suggests that children from conflictual, punitive, and rejecting families, will attempt to obtain prestige elsewhere. Consequently, the youth will be receptive to delinquent influences and will engage in activities that will raise their status within a delinquent peer group. Given that research (Slaby & Guerra, 1988) has shown that male offenders perceive that aggression will increase self-esteem and status within the peer group, it

seems reasonable to conclude that violence may be perceived as a means of obtaining status and prestige for individuals from conflictual families.

Social control theory (Hirschi, 1969; cited in Patterson et al., 1989) views inadequacy of supervision and harsh discipline as evidence of disrupted parent-child bonding. This leads to a lack of identification with parental and societal values, and results in a failure to observe societal rules and regulations.

Overall, general theories of delinquency and crime have focused almost exclusively on the male offender (Gora, 1982). The exclusion of females in studies of crime lead Harris (1977) to suggest: "general theories of criminal deviance are now no more than special theories of male deviance" (p. 3). Simon and Baxter (1989) stated that a "major difficulty in integrating studies on women and violent crime stems from the absence of gender as a major analytic variable in contemporary theoretical approaches" (p. 173). However, in the last two decades three broad categories of theories have been advanced to explain criminality and/or violence in females. These are psychological, physiological, and sex role theories, discussed, in turn, below.

Theories of Female Violence

Psychological and Physiological Theories: Early theories of

female criminality tended to focus on psychological and physiological explanations of the "nature of women" (Gora, 1982, p. 2), whereas theories of male offenders were more likely to emphasize social and cultural factors. Freud (1933, cited in Gora, 1982) suggested that female criminal behavior resulted from role reversal, particularly by women who were not happy with their roles as wives and mothers. Consequently, these women were considered to be maladjusted and deviant. Lombroso (1920) also claimed that women who commit crimes are more masculine than their conformist sisters. Lombroso focused on the physiological anomalies of the female offender, such as the "primitive traits" of dark hair, moles, and obesity.

Although few theories for gender differences with respect to violent behavior have been proposed, the higher number of violent crimes committed by boys has been linked to gender differences in aggressiveness, which has been argued to have a biological foundation (Quay, 1987). Maccoby and Jacklin (1974) found that gender differences in aggressiveness appear very early in life, in all human societies studied, and in nonhuman primates. They therefore argued that gender differences in early aggression can not be explained by differences in socialization, but are more likely related to levels of sex hormones such as testosterone. Support for some of these ideas comes from Denno (1990) who found evidence for greater contribution of

biological/physiological factors to female crime and social factors to male crime. However, such theories do not explicitly address the overall increase in violent offenses committed by both sexes, and for female adolescents in particular it is difficult to reconcile increased violence with mother-role or testosterone based theories.

Sex Role Theory: Adler (1975) and Simon (1975) were among the first to propose a sex role theory explicitly to address the rising crime rate in women. Sex role theory states that the Womens' Movement has led to an increase in the seriousness and extent of female criminal activity. Adler (1975) suggested that women are committing more "masculine" or aggressive crimes as a result of a change in sex role socialization and self definition.

Theories of increases in female crime based on the Womens' Movement propose that with increasing equalization of opportunities, the overall rate of crimes committed by women would increase. With respect to violent crimes, Inamdar et al. (1986) concluded their study by stating: "The increase in expressed aggression [by females] may be another indicator of the move toward progressive sexual equalization" (p. 707). Empirical support for sex role theory is primarily based on research by Simon and Baxter (1989), where in a longitudinal survey of 31 countries, they found a strong positive relationship between job and labour force opportunities and violent crime for women.

Adler (1975) suggested that the precursors of violence for women and men are more alike than different, and therefore previous crime rate patterns were a product of sex roles. Following from this, sex role theories would predict more similarities than differences in male and female offenders who commit violent crimes, due to more similar sociocultural forces acting on the sexes.

Quay (1987) also believes that, in general, the correlates of male and female delinquency are similar and that therefore traditional theories of male delinquency can also be applied to female delinquency. Denno (1990) reported that comparable factors influence delinquency and violence in both males and females but that the strength of these factors must be greater for females: "in light of the greater social and cultural controls on female behavior, females who do become delinquent or violent evidence relatively more biological or physiological deviations than their male counterparts" (p. 18).

Thus, in today's society, although equal opportunity is more of a reality, girls and boys are still socialized differently. Denno (1990) pointed out that females who become violent will generally have more biological and environmental difficulties "because serious female aggression is highly abnormal conduct" (p.27) given the greater social forces for nonaggressive behavior.

To summarize, two ideas emerge from the above

literature: 1. the factors that produce violence in males and females will be more similar than different and 2. although the factors may be similar, they likely differ in intensity such that violent females are more extreme on those factors than are violent males.

A primary difficulty with sex role theory is that it does not explain the increase in the rate of violent crimes committed by males. Additionally, sex role theory focuses on biological/environmental factors, and makes little room for psychological characteristics (e.g., personality, intelligence) that might moderate or mediate the links between biology/environment and violence.

A Multifactorial Approach

Despite the many theories in existence that attempt to explain violence, there is fairly universal agreement that violent behavior is highly complex and multiply determined (Brownstone & Swaminath, 1989; Marohn, 1982; Monahan, 1981; Romney & Syverson, 1984). Lewis et al. (1987), for example, point out that among the variables used in their study, none uniquely caused violence. Rather, it is a combination of factors such as neurological impairment, history of physical abuse, and/or family violence that will make an individual act in a violent manner, especially if the person's threshold for aggression is lowered by the ingestion of drugs or alcohol. Denno (1990) stressed that the

integration of biological and environmental theories of violence is crucial to understanding how and why violence occurs. Thus, for the present study, several categories of variables were integrated to determine their relationship to violence in general, and to investigate whether the relationships differed for males and females. The following are variables that have emerged as important in recent research on violence in adolescence and were investigated in the present study.

Environmental Variables

Family Background Variables: Several familial and parental variables have been linked to delinquency in general, such as absence of father (Gibson, 1969), broken homes (Wilson & Herrnstein, 1985), large family size (Andrew, 1976), and low socioeconomic status (Rutter & Giller, 1984). Parental discipline, whether inconsistently applied, or overly harsh and punitive, has been linked to delinquency and aggression by numerous researchers (see Synder & Patterson, 1987 for a review of relevant literature in this area).

Walsh and colleagues (Petee & Walsh, 1987; Walsh & Beyer, 1987; Walsh, Beyer, & Petee, 1987a, Walsh, Beyer, & Petee, 1987b) have investigated adolescent violent crime and have consistently reported that family and parental characteristics are reliable predictors. The family and parental variables used in the above studies were items

rated for face validity by 26 child care professionals with extensive contact with adolescents who commit violent crimes. The following is a list of the 10 items considered to be most important:

1. Physical abuse of child
2. Psychological abuse of child
3. Parental substance abuse
4. Child states he/she feels unloved
5. Official runaway charges
6. Official unruly charges
7. Parental "serial monogamy"
8. Child from broken home
9. Child is illegitimate
10. Official truancy charges

For the purposes of the present study, six of the above variables were used (nos. 1, 2, 3, 7, 8, and 9), and variables numbered 4, 5, 6, and 10 were excluded due to insufficient data. A history of physical abuse and witnessing family violence are clearly important predictors of violent behavior (Lewis et al., 1982). Therefore, family violence, which was not investigated in the studies by Walsh et al. (1987) was included in the present research.

In a study comparing delinquents and nondelinquents Lewis et al. (1987) found that a history of physical abuse and family violence was more common for delinquents than nondelinquents, and that physical abuse distinguished more aggressive from less aggressive subjects. To explain this correlation of physical abuse and family violence with aggressive behaviors, Lewis et al. (1987) stated that "...children imitate what they see. Whether this imitation is called modelling or identification with the aggressor or

some other term is irrelevant. It happens" (p. 750).

Regarding sex differences and delinquency, the relationship between delinquency and broken home has been found to be stronger for girls than for boys (Bartol, 1980). Additionally, Lewis et al. (1982) found that delinquent girls had significantly more foster or group home placements than did delinquent boys. Therefore, number of foster or group home placements were also considered in the present study.

The above variables will be combined with the following factors from Rutter's (1978) adversity index: parental education, parental occupation, and family size to form 11 family adversity variables for the present study.

A Note on Definition of Physical Abuse: Definitions of physical abuse vary widely in the literature. Emery (1989) suggested that a consensual definition of abuse (or violence for that matter) is unlikely to be accomplished. Emery further stated that "the definitions of abuse or violence may never meet scientific standards because they are not intended to be scientific terms." (p. 322). He suggested, however, that researchers identify the operational definitions that they use. This will be attempted in the discussion to follow.

The most frequently reported definition of physical abuse is outlined in the U.S. Federal Child Abuse Prevention

and Treatment Act of 1974 (PL 93-237):

> "...the physical or mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of eighteen by a person who is responsible for the child's welfare under circumstances which would indicate that the child's health or welfare is harmed or threatened thereby." (cited in Gelles, 1985, p. 351).

The definition of physical abuse in the current research excludes sexual abuse, as this question was asked of only eight (9.5%) of the males in the sample. Therefore, to maintain comparable gender comparisons across variables, sexual abuse was not included under the definition of physical abuse. Although the term "excessive physical punishment" may better capture the meaning of physical abuse for the current study, "physical abuse" will be used instead for the sake of brevity.

Lewis et al. (1987) considered that physical abuse had occurred if a child had been "punched, beaten with a stick, board, pipe, or belt buckle, or beaten with a belt or switch other than on the buttocks...[or] if he had been deliberately cut, burned, or thrown downstairs or across a room. A child was considered not to have been abused if he was only struck with an open hand, or beaten with the leather part of a belt or with a switch on the buttocks only" (1987, p. 746).

This definition of physical abuse is lacking on several counts. First, it does not take into account *frequency* of abuse. If a child is physically punished on a daily basis,

even with an open hand, it is the opinion of this author that this would constitute physical abuse. Second, the *length* of the punishment should also be considered. For example, *any* form of physical punishment that lasts longer than about 10 seconds is beyond what would be necessary to impress punishment upon the child, and was considered abusive in the current research. Third, using any instrument other than an open hand, for the purposes of this study was considered physical abuse.

The British Columbia Ministry of Social Services and Housing (1988) defines child physical abuse as "any physical force or action which results in, or may potentially result in, a nonaccidental injury to a child which exceeds that which could be considered reasonable discipline". The Ministry considers several factors and decides on a case-by-case basis whether the abuse is sufficient to apprehend the child and place him/her in foster care (Personal Communication, April, 1994). The definition used by the Ministry is somewhat vague for the purposes of the present study, and was therefore not employed.

Thus, for this study, physical abuse was coded on a somewhat subjective dimension and was largely dictated by the researcher's impression based on the above points.

Drug and Alcohol Abuse: According to Monahan (1981), alcohol and drug use are among the most important predictors

of violent crime, forming what he refers to as one of the "major actuarial correlates of violent behavior" (p. 104). In an excellent recent review on mental disorder and violent behavior, Monahan (1992) reported that, in a large scale study using 10,000 individuals randomly drawn from households in three major U.S. cities (Swanson et al., 1990), the prevalence of substance abuse (either alcohol or other drugs) was eight times higher for violent than nonviolent individuals. Thus, for the present study, alcohol and drug use were investigated.

That environmental variables such as family situation and drug/alcohol abuse are related to violence is not particularly surprising and is consistent with the lay person's view of the causes of violent behavior. Recently a local newspaper reported on the growing problem of violence in Canadian public schools (Times Colonist, March 13, 1994). A violence prevention coordinator stated that "The family of today is not the family of a couple of generations ago. There is an increased rate of divorce, both parents working, drug and alcohol abuse, lack of extended family" (p. A2). However, the role of more subtle variables in violence, such as history of birth complications, intellectual factors, learning disabilities, and personality characteristics are often overlooked in the public eye. Nevertheless, research has shown that these variables can also have an important relationship to violent behavior in adolescents.

Biological Variables

Denno (1990) had access to a considerable number of biological factors and investigated their relationship to violence. These factors included mother's reproductive history, recent and past medical history, prenatal examination and laboratory test results, all drugs taken during pregnancy, and labour and delivery events. Denno found that biological variables and environmental variables, similar to those described above, were in themselves highly correlated, but that together they predicted 25 percent of future adult criminality among males and 19 percent among females.

The current data set does not include the large number of biological variables that are investigated in the Denno (1990) study. However, presence of birth complications, premature birth, birth weight, and significant childhood diseases were recorded.

Intellectual Variables

Wechsler Intelligence Scale: Studies that control for SES, race, and involvement in the criminal justice system report associations between lower intelligence and delinquency (Hirschi & Hindelang 1977; Moffit et al., 1981; Quay, 1987; Rutter & Giller, 1984). The finding of an IQ deficit of half a standard deviation (about eight IQ points) has become well accepted (Moffit & Silva, 1988; Quay, 1987). However,

as Quay (1987) has pointed out, the eight IQ point discrepancy is primarily due to lower scores on Verbal IQ subtests, such as Vocabulary, Information, and Similarities.

Several tentative suggestions have been put forward to explain the lower verbal intelligence of young offenders. Hirschi and Hindelang (1977) have suggested that lower verbal abilities impact on school performance which affects attitudes towards school and that these negative attitudes stemming from school failure eventually lead to delinquency. However, the direction of the effect has not been well established. Some argue that antisocial behavior *precedes* school failure (e.g., McMichael, 1979), whereas Tarter et al. (1984) and Yeudall (1980) have suggested that poor verbal ability decreases the development of those internally mediated verbalizations that inhibit antisocial behavior and impulses.

Other studies have shown that, in addition to verbal deficits and consequent school failure, visuospatial skills are also weak among delinquents (Moffit & Silva, 1988; Robbins et al., 1983). These authors suggest that opportunities to achieve outside of school in extracurricular activities such as arts and athletics are compromised due to weak visuospatial abilities. This combination of lower verbal and visuospatial abilities results in a lack of prosocial sources of self-esteem, which may then increase the risk of delinquent behavior.

According to Quay (1987), it has been suggested that those delinquents who are apprehended are those who are also more likely to be of lower intelligence. However, West and Farrington (1977) have shown that self-reported delinquency is negatively related to IQ, suggesting that delinquent acts may be related to lower intelligence regardless of whether the youth is "caught". Lewis et al. (1987) found that, in general, the same types of variables (including intelligence) distinguished violent from nonviolent youth whether they were delinquent or not, indicating that those variables associated with violent behavior are not merely a correlate of an adolescent's legal identification as delinquent.

In addition to studies on the relationship of psychometric intelligence levels to delinquency and violence, many studies have attempted to confirm Wechsler's earlier (1958) observation that the adolescent sociopath typically scores higher on the performance section of the Wechsler IQ scale relative to the verbal section (PIQ > VIQ). Recent studies of this nature have reported a higher PIQ > VIQ discrepancy in delinquent versus nondelinquent adolescents (Cornell & Wilson, 1992; Culberton, Feral, & Gabby, 1989; Haynes & Bensch, 1981; Hays, Solway, & Schreiner, 1978; Hecht & Jurkovic, 1978; Hubble & Groff, 1981).

Several studies have also reported that a PIQ > VIQ

discrepancy is associated with violent as opposed to nonviolent delinquency (Hays et al., 1978; Tarter, Hegedus, Winsten, & Alterman, 1985; Walsh & Beyer, 1986; Walsh, Beyer, & Petee, 1987). Quay (1987) noted that when delinquents are placed into subgroups according to level of aggressive characteristics, the more aggressive, psychopathic offenders are most likely to evidence the greatest PIQ > VIQ discrepancy. However, at least one study (Cornell and Wilson, 1992) was unable to replicate this finding.

A more detailed approach to IQ analysis involves the investigation of individual subtests. Syverson and Romney (1985) found that violent young adult males (mean age = 17.4 years) scored significantly lower than nonviolent males on the Information, Comprehension, and Object Assembly subtests on the WAIS. Spellacy (1977) found that violent male adolescents had lower Block Design, Similarities, and Vocabulary scores than nonviolent males. Unfortunately, apart from the fact that more verbal than nonverbal subtests were useful in discriminating violent from nonviolent offenders in both studies, there was no overlap in the subtests identified as discriminating between violent and nonviolent offenders.

The Similarities subtest has received some attention as a possibly useful test in discriminating violent from nonviolent offenders. Several studies (Hays & Solway,

1977; Kunce, Ryan, & Eckelman, 1976; Ryan & Blom, 1979; Shawver & Jew, 1978) have attempted to discriminate violent from nonviolent offenders using a "similarities ratio", which is a ratio of the Similarities score to the total of all the subtests (Similarities score/sum of 11 subtests X 100). Kunce et al. (1977) reported a relative deficit on the Similarities subtest for violent offenders compared to nonviolent adult offenders.

Several studies have failed to replicate this finding in samples of adult offenders (Ryan & Blom, 1979; Shawver & Jew, 1978; Syverson & Romney, 1985), and Hays and Solway (1977) were unable to replicate this finding in a sample of adolescents. Quay (1987) has concluded that, in general, "profile analysis of subtest scores has not been revealing with respect to subaspects on the intellectual functioning of delinquents" (p. 113).

Methodological problems of the above research are those that are common to most areas of research. These include definition of main variables under investigation such as violence, criteria for defining a PIQ > VIQ discrepancy, sample characteristics, and method of subject selection (Cornell and Wilson, 1992).

Few studies have investigated gender differences with respect to intelligence measures and violent crime in adolescents. However, Denno (1990) found that for both males and females separately, violent and chronic offenders

scored lower on the WISC Verbal IQ than did less serious and nonchronic offenders. Lewis et al. (1982) reported no significant differences between male and female incarcerated offenders on WISC IQ scores or subtest scores. However, the sample used for this study was relatively small (19 girls and 35 boys).

The present study investigated overall intellectual ability and the PIQ > VIQ discrepancy for violent and nonviolent males and females, using age-appropriate Wechsler intelligence scales.

Achievement: Several studies (Robins, 1966; Tarter et al., 1985; Yale & Rutter, 1968) have shown that delinquents in general are more likely than their peers to have a learning disability (LD). Lewis et al. (1982) found approximately equal numbers of learning disabled males and females in their sample of incarcerated delinquents. Although, the percentage of their sample with LD was not reported, they did state that the males and females were of average intelligence with learning deficits beyond what would be expected given their intellectual abilities.

However, in terms of the relationship between LD and violence, Tarter et al. (1985) did not find that violent delinquents were more likely to be learning disabled than nonviolent delinquents, and Bryant et al. (1984) reported a similar negative finding for adults. Bryant et al. defined LD as being present if the WRAT Reading or Arithmetic

standard score was less than or equal to 79 in an individual with an IQ at least within the Average ranges. Unfortunately, the WRAT standard scores were analyzed as group *averages*, rather than for individuals. Thus, whether the number of violent versus nonviolent individuals who were learning disabled was significant was not reported.

Denno (1990) did not address presence of LD in her sample but found that overall, both male and female violent juvenile offenders scored consistently lower on achievement tests than nonviolent offenders. However, Denno also found a greater discrepancy between achievement test scores of female violent and nonviolent offenders than for violent and nonviolent males. Denno concluded that female offenders appear to deviate more than males on tests of intellectual abilities. Unfortunately, Denno did not measure intraindividual discrepancy of achievement and intelligence test scores. It appears, then, that research to date on learning disabilities and academic underachievement with violent youth has provided inconclusive results and deserves further investigation.

To summarize, lower intelligence and verbal abilities appear to be a robust finding among delinquents in general, and particularly among violent delinquents. Quay (1987) suggested that lower intelligence is one of many factors that may reduce the chances for success in interacting in a variety of situations that occur during the process of

development. Hogan and Quay (1984) proposed that poor verbal skills are likely to underlie higher order "personality-cognitive" functions such as interpersonal problem solving, verbal self-regulation, person-perception, and moral reasoning.

Personality

Typically studies that address personality characteristics of young offenders compare delinquents versus nondelinquents (see Arbuthnot, Gordon, & Jurkovic, 1987, for a review of this literature). However, as Quay (1987) has emphasized, lumping delinquents into a single category for comparison is problematic because delinquent youth are behaviorally and psychologically heterogeneous. Quay believes that a more effective strategy would be to compare identifiable subsets of delinquent youth with respect to some relevant subset of psychological or behavioral characteristics. Therefore, as before, the following discussion will focus on those studies that compare personality characteristics of violent and nonviolent delinquent youth, and/or males versus females.

Several studies have investigated the personality traits of violent offenders, and have reported such characteristics as poor ego strength or immature ego (Schoenfeld, 1971); strong feelings of rage and low self-esteem (Strasburg, 1978); depressed anxiety (Kulik, Stein,

Sarbin, 1968); social alienation and inability to delay gratification (Vachss & Backal, 1979); and lack of empathy and impulse control (Sorrels, 1980).

With respect to personality characteristics of female offenders, Lewis et al. (1982) reported that there is some evidence in the literature that indicates female adolescent offenders and female adult offenders are more psychologically impaired than their male counterparts (e.g., Healy & Bronner, 1926; Cowie, Cowie, & Slater, 1968). However, none of the studies reviewed by Lewis et al. systematically compared male and female delinquents in terms of psychiatric diagnosis or symptomatology.

Lewis et al. (1982) reported that, in their sample of 19 girls and 35 boys from a secure treatment unit, the two groups were "remarkably alike in all respects" (p. 193) when compared on a number of psychiatric, neurological, family history, and psychoeducational variables. However, both boys and girls who had committed more violent crimes were more likely to show paranoid features than those who had committed less violent crimes. In general, the findings of Lewis et al. (1982) "contradict the literature that reports greater psychopathology in female delinquents than in male delinquents" (p. 194).

In a later study, Lewis et al. (1987) again found that the psychological symptom most often associated with aggression was paranoid ideation. They suggested that

paranoid adolescents tend to "take offense easily, to misinterpret situations, and to lash out quickly in response to imagined provocations" (p. 750). They further stated that these aggressive youth may hallucinate insults directed towards themselves or their mothers and respond aggressively. Lewis et al. (1987) reported that their sample of adolescents did not qualify for a diagnosis of schizophrenia, but rather they appeared quite normal and only occasionally experienced episodes of paranoid misconceptions. Other studies have also found that paranoid ideation is the most important characteristic that distinguishes violent from nonviolent individuals (Holcomb & Anderson, 1983; Loberg, 1983; Petrie et al., 1982; Yesavage, 1984).

The personality instrument most often employed in research with offenders is the MMPI (Arbuthnot et al., 1987). For violent adolescent offenders, the findings from MMPI research vary widely. This may be due to differences in sample types, analyses of results, definition of violence, definition of MMPI profile validity and exclusionary criteria, and/or definition of groups to be distinguished by the MMPI. Nevertheless, a few relevant MMPI studies will be discussed below. The following list of MMPI variables and their typical clinical interpretations will serve as a reference for the research to be discussed:

L	Lie	Attempt to present favorably
F	Frequency	Wish to appear abnormal

	K	Correction	Defensive attitude
1	Hs	Hypochondriasis	Cynical, dissatisfied
2	D	Depression	Withdrawn, sad
3	Hy	Hysteria	Multiple body complaints
4	Pd	Psychopathic Deviate	Adventurous, antisocial
5	Mf	Masculinity/femininity	Artistic, sensitive (M); Rebellious, assertive (F)
6	Pa	Paranoia	Suspicious and jealous
7	Pt	Psychasthenia	Anxious, self-doubting, rigid
8	Sc	Schizophrenia	Seclusive, bizarre
9	Ma	Hypomania	Outgoing, impulsive
0	Si	Social introversion/ extroversion	Modest, shy Sociable, exhibitionistic

Early studies using the MMPI to differentiate violent from nonviolent offenders investigated mean two-point codes. Many reported that violent criminals were likely to show a 4-3, or 4-8/8-4 two-point code (Armentrout & Hauer, 1978; Bauer & Clark, 1976; Hathaway & Monachesi, 1963; Panton, 1962; Persons and Marks, 1971). However, others failed to replicate these findings (Johnson, 1971; Lothstein & Jones, 1978), and Marks, Seeman, & Haller (1971) argued that 4-8/8-4 code types are also exhibited by nonoffenders.

A potential problem with MMPI two-point code research is that many studies report *group* means for the two highest standard MMPI scale elevations. This does not provide important information with respect to the frequency or percentage of individuals obtaining scale elevations or two-point codes.

More recently Fraboni, Cooper, Reed, and Saltstone (1990) found that neither the 4-3 or the 4-8/8-4 two-point code types were successful in discriminating between violent and nonviolent offenders in their sample of 67 adult males.

Thus, it appears that investigating two-point codes for samples provides little useful information (Megargee, 1976).

Two studies investigating univariate significance of isolated MMPI scale elevations between violent and nonviolent adults (Chick & Loy, 1984) and adolescents (Spellacy, 1977) found that violent offenders had, on average, higher scores on scales F, Hs, D, Pa, and Sc. Jones, Beidleman, & Fowler (1981) also found that MMPI scales F, Pa, Pt, and Sc contributed most to prediction of membership in violent versus nonviolent prison inmates.

Few studies have used the MMPI to investigate personality differences between male and female offenders. However, in one such study, Panton (1975) found that adult females scored higher, on average, on the Pa and Si MMPI scales, and that males scored higher on the Hs and D scales. Investigation of the Harris and Lingoes (1955) subscales revealed that Pa2 mainly contributed to the elevated Pa scores of the women. Pa2 indicates a tendency to see oneself as special and different from others; to think of oneself as high-strung; to be overly sensitive, and to cherish sensitive feelings (Panton, 1975). Unfortunately, Panton reported group means only and did not report frequency of elevated scales. Therefore, the number of women that actually obtained clinically significant elevations on Pa was not available.

The above MMPI research seems to converge on the

finding that Pa is an important MMPI scale in discriminating violent from nonviolent offenders and males from females if the Harris Lingoes subscales (scales that break down the ten standard MMPI scales into four "subscales" each; thus providing more detailed information regarding reasons for a particular standard scale elevation) are also taken into account (Pa2 is higher for women). Apart from these findings, MMPI results from violent offender samples have yielded equivocal results to date.

A potential problem with using MMPI profiles to discriminate violent from nonviolent offenders is that those clinical syndromes best captured by the MMPI (Axis I of the DSM-III-R) may be under-represented in delinquent populations, independent of violence levels. Indeed, the most frequent personality characteristics reported in research with violent young offenders, which were discussed earlier (poor ego strength, feelings of rage, low self esteem, social alienation, lack of empathy, and poor impulse control) may not be reflected in the ten clinical MMPI scales.

However, the Millon Adolescent Personality Inventory (MAPI; Millon, Green, & Meager, 1982) is a relatively new self-report inventory that has several scales that relate not only to the above personality characteristics (e.g., scales termed Self-Concept, Personal Esteem, Confident, Forceful, Impulse Control), but to other variables

previously mentioned as well (e.g., Family Rapport, Scholastic Achievement). Additionally, scales such as Societal Conformity, and Respectful may also discriminate violent from nonviolent male and female offenders. Thus, the MAPI may be an excellent addition to the MMPI when investigating the relationship of personality variables and violence, and was included in the present research. To date, the MAPI has not been used in research with adolescent violent offenders. Consequently, analyses involving the MAPI will primarily be exploratory.

As several authors have suggested, it may be that it is almost impossible to predict accurately violent behaviors solely on the basis of personality test results. Rather, a multivariate approach, in which personality test scores are combined with other data (e.g., situational variables such as family and school circumstances) may enhance prediction (Briggs, Wirt, & Johnson, 1961; Jones et al., 1981; Megargee, 1976; Monahan, 1981).

For example, Heilbrun (1979) found that level of intelligence (as measured by the IPAT Culture Free Intelligence Test; Cattell & Cattell, 1958) was a moderator variable for violence and impulsivity of crimes in psychopaths (defined by scores on the MMPI psychopathic deviate and CPI socialization scales). He pointed out that, although psychopathy as a personality variable alone has not been successful in predicting violence in past research,

when this personality variable is combined with cognitive functioning (in this case lower level of intelligence), prediction significantly increases. Heilbrun suggested that "a more sophisticated statistical approach, such as discriminant function analysis, would allow a more specific determination of how much cognitive functioning improves prediction beyond level of psychopathy." (p. 514).

Thus, for the present research, personality variables were combined with other variables suggested to be important predictors of violence (e.g., intelligence measures, family background variables).

Definition and Measurement of Violence

After a thoughtful review of the literature, Monahan (1981) agreed with Megargee's (1976) definition of violence: "acts characterized by the application or overt threat of force which is likely to result in injury to people" (p. 12). The word "threat" was included in this definition to allow for the inclusion of acts such as armed robbery and other situations where injury is threatened but does not occur. "Likely" accounts for those situations such as shooting at someone and missing, which would also be considered violent.

Although many authors appear to agree on similar definitions of violence, the actual measurement of violence varies greatly from study to study. Heilbrun (1979) defined

violent crime in accordance with the standards used by the Federal Bureau of Investigation (Kelley, 1972, cited in Heilbrun, 1979). Crimes involving the use of threat or force against persons were considered violent (e.g., murder, manslaughter, assault, rape, robbery), whereas crimes against property were nonviolent offenses (e.g., larceny, car theft, forgery, violation of drug act). Also, if a prisoner had committed several crimes, he was considered violent if any of these crimes fell in the violent grouping. Thus, Heilbrun used a simple dichotomous method of categorizing violence.

Lewis et al. (1979, 1982, 1987) and Inamdar et al. (1986) use a four point scale on which subjects were rated 1 if they have not committed an offense against any person or committed arson, 2 if there is a perceived potential for violence, 3 if they have committed a violent offense, and 4 if the subject had demonstrated extraordinary brutality toward others. This scale for rating violence can be criticized on several grounds. The ratings are subjective (by the authors' own admission); particularly a rating of 2 which was obtained from medical charts. Additionally, Lewis et al.'s rating scale did not include number of assaults, use of a weapon, or number of people involved in their scale.

Gora (1982) drew on the work of Rossi, Waite, Bose, and Berk (1974) to rank order the seriousness of 14 most

commonly committed offenses in her sample. Rossi et al. attempted to discover which criminal acts were "regarded as more or less serious in the popular eye" (p. 225, cited in Gora, 1982). They found that the extent of damage inflicted was not as important as the type of damage, even whether it be to people rather than to property. Hence, there are some problems with the ratings. For example, robbery, and intent to sell drugs were rated as more serious offenses than assault, rape, or incest. Therefore, this rating system was not used for the present study; rather offenses were rated for seriousness depending on level of harm or injury inflicted on another individual.

Violence was originally coded on the following five point scale for the present study:

1. property or mischief offense
2. one assault charge
3. two or more assault charges
4. one assault charge causing bodily harm
5. two or more assault charges causing bodily harm

However, as will be discussed in the methods section, this coding scheme was later converted to Heilbrun's (1979) dichotomous rating due to insufficient numbers of subjects within several cells.

Additionally, the number of individuals involved in the offense was recorded, as Aultman (1980) found that violent offenders more often committed their crime while alone than nonviolent offenders. Quay (1987) reported that males are more likely than females to use a weapon during the course

of a violent act. The present research attempted to replicate these findings.

Summary

Relatively few studies have investigated gender differences for adolescent violent offenders. Tremblay (1991) noted that little attention has been given to aggressive female adolescents, and recommended that researchers increase the attention and energies given to conduct disordered girls. Perhaps the largest study to date investigating male and female young offenders, a portion of whom had committed violent crimes, was undertaken by Denno (1990). She analyzed data from 987 (487 males and 500 females) subjects that were collected from birth to adulthood. Of these 987 subjects, only 44, or 4.46 percent had committed violent crimes. Of the 44 violent offenders in her sample, only eight of these (1.6 %) were female. The subjects for this study were all black and were predominantly from lower SES households, compared to the general U.S. population. Subjects were born between 1959 and 1962 and were followed until the age of 22 years (latest data collected in 1984). Unfortunately, personality variables were not investigated in this study. Additionally, males and females were not compared directly; rather male and female violent offenders were separately compared across time and to same-sexed nonviolent offenders.

Nevertheless, she did find evidence for greater contribution of biological factors to female crime and social factors to male.

Research that directly compares male and female delinquents would address whether theories of violent crime derived from studies of male populations would indeed be applicable to females and is the focus of the proposed research. With respect to sex differences in the commission of crimes, Rasche (1975) stated: "Certainly the primary, albeit global, assignment is to validate previous criminological findings derived from male samples against female populations" (p. 27).

Hypotheses

The hypotheses of the present study can be divided into two general types. One type investigated overall mean level differences in biological, environmental, intellectual, and personality differences among male and female offenders who vary in offense violence. The second class explored the nature and extent of relationship among biological, environmental, intellectual, and personality variables as causes of violence, and compared potential causal models across gender.

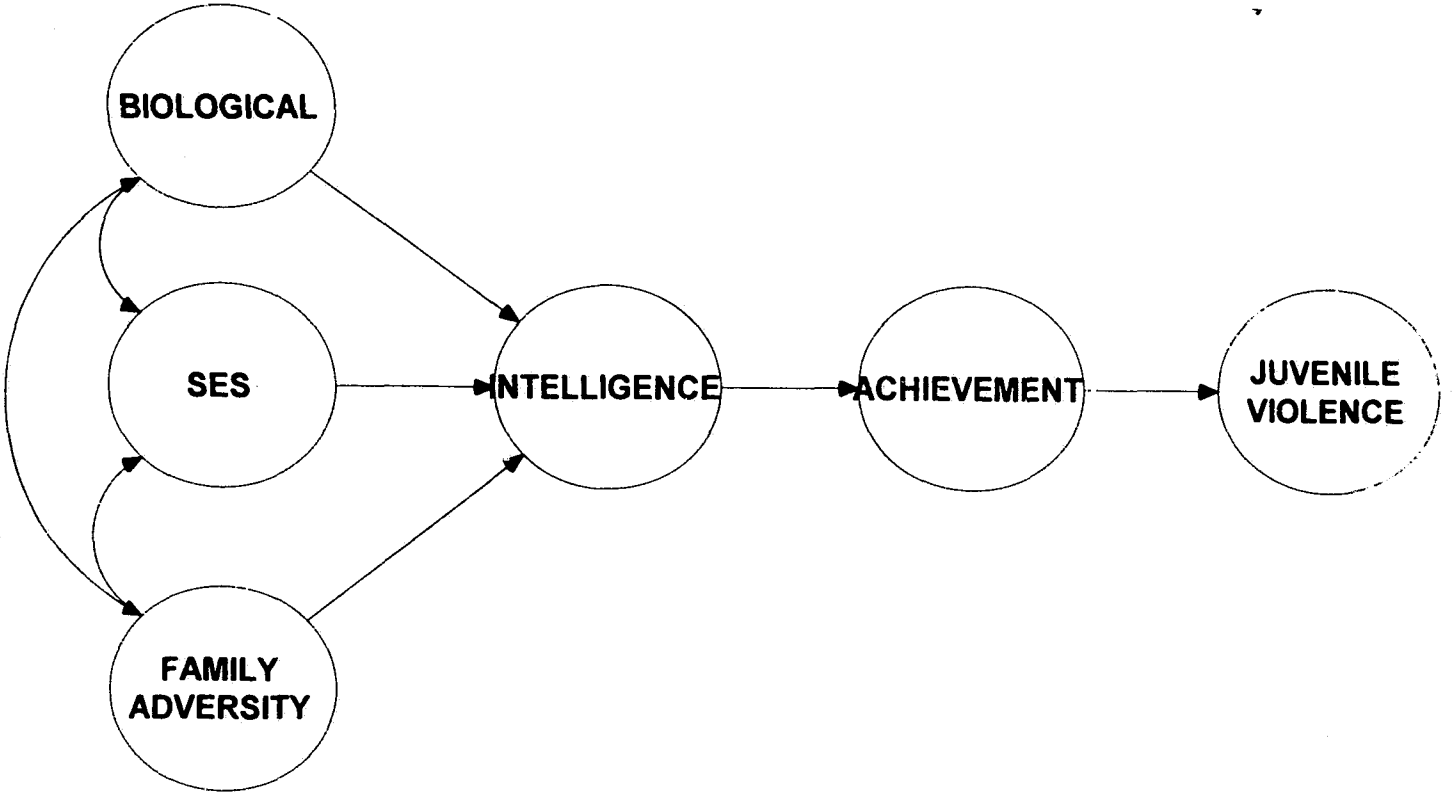
A major prediction evolving from the theoretical and empirical work on violence is that increasing violence is associated with greater deviance on a variety of biological, socio-environmental, intellectual, and personality

characteristics, and that such deviance should be relatively greater for females compared to males. That is, in spite of the trend toward sexual equalization, males and females are still socialized differently enough to consider female violence more "abnormal" than male violence. Thus, for the present research it was expected that on each class of variable (biological, environmental, intellectual, and personality) there would be:

a. a main effect of violence such that more violent offenders will be more deviant than less violent offenders.
b. a main effect of gender due to females presenting a more deviant profile than males.
c. an interaction between gender and violence such that sex differences will be more pronounced for violent versus nonviolent offenders.

Assuming these hypothesized effects were to hold, such mean level differences still do not explain how biological, environmental, etc. variables interrelate to produce violence, nor whether potential causal relationships are the same for males and females. Denno (1990) proposed the model of juvenile crime and violence illustrated in Figure 1. As previously mentioned, the subjects for this study were all black and were predominantly from lower SES households compared to the general U.S. population. Moreover, personality variables were not investigated in this study,

Figure 1



ADAPTATION OF DENNO'S MEDIATION MODEL OF JUVENILE VIOLENCE

and males and females were not directly compared. The present study attempted to confirm this model in a sample of predominantly white Canadian young offenders. Additionally, models were explored that incorporated personality mediators, and males and females were directly compared for overall model fit as well as for relative strength of model paths.

CHAPTER II

METHOD

Subjects

Subjects were 84 male and 83 female young offenders between the ages of 12 and 17 who had been referred to Forensic Psychiatric Services, Victoria, for predisposition assessment or treatment between 1988 and 1993. Client confidentiality was maintained by assigning numbers rather than names to each subject. Written consent for data use was obtained from appropriate agency officials.

For females, all files from a total of approximately 250, with relatively complete data were used for the present study. Files for males were then selected on a random basis until the number of violent and nonviolent offenders were divided equally for both sexes. This division was based on the original coding scheme for violent offenses (i.e., five levels of violence), which was eventually collapsed into a dichotomous rating of violent versus nonviolent offenses. Thus, subjects were divided into violent and nonviolent groups for both males and females. Violent offenders were those who had committed one or more assaults and nonviolent offenders were those who had committed property crimes (e.g., break and enter, shoplifting). Using this classification scheme, there were 48 nonviolent females, 35 violent females, 49 nonviolent males, and 35 violent males.

The mean age of the females was 14.46, while the mean age of the males was 14.94, which was a statistically significant difference ($p < .05$). All analyses were performed with and without age partialled. None of the results changed by partialling age, so only those in which age was not included will be reported. The mean age for violent offenders, independent of gender, was 14.7, and for nonviolent offenders the mean was 14.6 (nonsignificant difference). The mean school grade for females was 7.93 and for males it was 8.23 (nonsignificant difference).

Eighty nine percent of the females and 91 percent of the males were Caucasian (nonsignificant difference). Non-Caucasian individuals were primarily of Native Indian descent (eight percent), while only two percent of the total sample included individuals whose origins were other than Native Indian or Caucasian.

A random subset of 20 subject files was coded by a second rater to establish inter-rater reliability. Disagreement occurred during coding three instances of physical abuse. These disagreements were discussed with reference to relevant literature, and an agreement was reached in every case.

Measurement of Violence. Three offense characteristics were initially coded, namely severity, presence of a weapon during the offense, and number of people involved in committing the offense. As previously mentioned, violence

was initially coded on a five point scale (1 - property crime, 2 - one assault charge, 3 - two or more assault charges, 4 - one assault charge causing bodily harm, and 5 - two or more assault charges, at least one of which caused bodily harm). Initial analyses revealed that this coding of violence resulted in insufficient cell sizes for the various groups. For example, there were only 15 subjects in the total sample with a coding of 3, 15 with a coding of four, and 8 with a coding of five. The remaining variables (number of people involved in the offense and presence of a weapon during the offense) were deleted from analysis after initial inspection revealed that they were not significantly related to any of the other variables.

Family Adversity Variables: As previously discussed, the following variables have been found to be important predictors of violent behavior in adolescents and were recorded and coded as follows:

1. Physical abuse (for definition see introduction): 0 = No evidence; 1 = Clear evidence found in subject's file.

2. Psychological or emotional abuse: 0 = No evidence; 1 = Clear evidence found in subject's file.

3. Parental substance abuse: 0 = None; 1 = at least one parental figure is reported to have a substance abuse problem

4. Parental serial monogamy: 0 = Biological parent(s) had 2 or fewer relationships after divorce or separation; 1 = 3 or more relationships after divorce or separation.

5. Broken home: 0 = no; 1 = original parents separated or divorced whether living common-law or married when subject

was born.

6. Born to single parent: 0 = No evidence in file; 1 = Clear evidence in file.

7. Witness to family violence: 0 = No; 1 = Yes.

8. One or more foster or group home placements: 0 = No; 1 = Yes.

9. Socioeconomic Status (SES): 0 = professional or skilled labour of either parent; 1 = unskilled labour or unemployment of both parents (or parent if living in single-parent home).

10. Family size: 0 = two or fewer siblings; 1 = three or more siblings.

11. Parental education: 0 = both parents completed at least grade 12; 1 = one or both parents not completed grade 12.

Variables 2 (emotional abuse; N = 105) and 4 (parental serial monogamy; N = 113) were deleted from analyses due to insufficient data. An additional reason for the exclusion of variable 2 was that it was very difficult to code in an objective manner, in that evidence of some form of emotional abuse could be found in almost every file. Emotional abuse did not lend itself to a dichotomous coding scheme and files tended to lack sufficient information for a more complex breakdown of this potentially important variable. Variable 4 was found to show no discernible relationship with all other variables included in the present study, adding an additional reason for its exclusion.

Biological Variables: As previously discussed, presence of birth complications (coded as present or absent), and

gestation period (recorded in weeks plus or minus from time of due date; 2 indicates 2 weeks late, 0 indicates born on due date, -2 indicates 2 weeks early), were recorded and considered "perinatal" variables. Significant childhood diseases prior to the age of five (coded as presence versus absence) were also recorded, and considered a "postnatal" variable. Birth weight was recorded in ounces, and although males (mean = 123) showed an expected significantly higher weight than females (mean = 118), this variable was not related to other variables in the present study, and was therefore deleted from further analyses.

Intellectual Variables: Data were collected from age-appropriate Wechsler intelligence scales (WISC-R or WAIS-R FIQ, VIQ, PIQ, and all subtests except Mazes) and the WRAT-R (Reading, Spelling, and Arithmetic) for all subjects. The difference between the number of males versus females and violent versus nonviolent individuals who had been administered the WISC-R versus the WAIS-R was nonsignificant.

Academic Underachievement: Academic underachievement was determined by comparing FIQ scores with WRAT-R Reading, Writing, and Spelling, to investigate statistically significant differences between the two measures.

School History: Number of grades failed were recorded for two reasons: 1) to determine whether this was related to IQ and achievement test results; and 2) school failure is likely experienced as stressful and may relate to level of violent crime. Number of school changes was originally recorded but not included in analyses, as initial results indicated that this was not related to other variables included for study.

Personality Variables: Personality variables included valid MMPI and MAPI profiles. Gearing (1979) emphasized that an F scale elevation above 80 (T score) may actually be valid, especially with offender populations. He suggested that a good deal of MMPI research with offenders in general is compromised by an "overly rigid application of conventional validity criteria" (p. 941). Gearing therefore recommended that *random* profiles only be discarded until further research produces dependable indicators of faked offender profiles. The results of several studies (Abe, 1969; Gendreau, Grant, Leipciger, & Collins, 1979; Shindo, 1969) have raised the question of the appropriateness of using the F scale as a measure of response validity in delinquent samples, as F scores have been found to covary directly with degree of delinquency. In fact, Gregory (1977) has suggested that high F may reflect a clinically significant code type among young offenders.

Thus, based on the adult and young offender research with the MMPI, only MMPI profiles that had random responses were excluded from analysis in the current study. Subjects with a grade six or higher reading level (Hathaway & McKinley, 1951) were administered the MMPI in paper and pencil form. Those with less than a grade six reading level had the MMPI read to them by the examiner. Questions that were not understood were clarified.

Profile validity for the MAPI is based on the following three items:

58. I have not seen a car in the last ten years.

85. At no time in my life have I had any hair on my head or my body.

124. I have flown across the Atlantic 30 times last year.

Millon et al. (1982) consider a score of one as indicating questionable validity and advise caution in interpretation. Therefore, only those profiles with a validity score of 2 or more were excluded from analyses. However, if a subject obtained a score of 1 on the validity index and also produced an invalid MMPI, he/she was not included in the study.

Substance Abuse: The subjects' use of alcohol and/or drugs was recorded and coded on a scale from zero to four:

0 - no drug or alcohol use

1 - very mild experimentation (occasional alcohol and/or marihuana use

2 - poly-substance experimentation with no evidence of abuse (alcohol plus one or more "hard" substances; e.g., cocaine, crack, LSD)

3 - clear abuse of one substance (e.g., daily alcohol, cocaine or marihuana use)

4 - abuse of at least one substance plus poly-substance experimentation.

Due to lack of sufficient information within the files, the definition of "abuse" used for the current research differs from the definition of Substance Abuse and Substance Dependence in the DSM-IV (APA, 1994). The current definition is based on the *frequency* and *type* of substance use alone, and does not consider the subject's cognitive and physiological symptoms (required for a diagnosis of Substance Dependence), or presence of "significant adverse consequences related to the repeated use of substances" (p. 182; required for a diagnosis of Substance Abuse).

To summarize, the following variables were initially coded, but deleted from further analyses due to insufficient data in subject files (defined as 20% or more missing data on that particular variable) or no relationship to other variables: number of people involved in the offense, presence of a weapon during offense, parental serial monogamy, emotional abuse, number of school changes, and birth weight.

CHAPTER III

RESULTS

Outline of Statistical Analyses

Statistical analyses focused on two aspects of the data: (1) tests of mean level differences among the gender, violence, and gender by violence subgroups; (2) exploratory modelling of the potential causes of violence.

1. Tests of Mean Level Differences. The general thrust of these analyses were to investigate the mean differences among gender by violence subgroups. Noncommensurate variables (i.e., those variables that are not measured on the same scale) were analyzed with multivariate analysis of variance (MANOVA). Commensurate variables (i.e., those variables measured on the same scale, e.g., T scores are used for all 13 MMPI scales) were analyzed using profile analysis. Profile analysis is a specialized form of MANOVA applied when a set of dependent variables is measured on the same scale (see Tabachnick and Fidell, 1989 for a thorough discussion of this technique). Essentially this method is used to determine whether different groups of subjects show the same pattern of high and low scores on a set of subtests (parallelism of profiles); whether one group scores higher on average on the set of variables (the levels test); and the similarity across subtests independent of groups (flatness of profiles).

In discussing the results, priority was given to the

highest order interaction, followed by lower interactions and main effects. The grouping variables were gender and violence level (nonviolent or violent offenders) and their interaction.

Rather than analyzing all variables simultaneously, they were categorized into conceptually consistent categories (e.g., biological, family adversity, intellectual, personality, and school achievement), and ranked according to logical priority. Thus, birth complications, prematurity, and childhood diseases were categorized as biological variables, the Wechsler subtests as intelligence variables, the MMPI and MAPI as personality variables, and so on. Biological and family adversity variables were considered to precede intellectual and personality variables, which in turn precede school achievement. Additionally, large categories were analyzed both in their entirety and as factors derived using principal components analysis. The former case maintains any implied interpretations by preserving the variables as they appear in clinical settings. The latter case reduces the complexity of overall interpretation by focusing on fewer underlying dimensions. Thus, for each category of variables the analyses proceeded in four steps:

Step 1. Each set of variables was analyzed in its entirety (e.g., the 9 family adversity scores), with no other variables partialled.

Step 2. The analyses from Step 1 were repeated, but with logically prior and contemporaneous variables partialled using a multivariate analysis of covariance (MANCOVA) stepdown analysis. Whereas Step 1 analyzed the total variance in a given set of variables, Step 2 analyzed the set of variables while controlling variance accounted for by prior variables.

Steps 3 and 4. Family adversity, MMPI, and MAPI scores were submitted to principal components analysis and the resulting factors were analyzed without partialling (Step 3), and using MANCOVA to control for logically prior variables (Step 4).

2. Causal Modelling. The nature and extent of interrelationships among potential causes of juvenile violence were evaluated using structural equation modelling. A second series of causal models was investigated that expanded upon Denno's model to include personality variables. In spirit these analyses were more exploratory (hypothesis generating) than confirmatory (hypothesis testing) due to the absence of explicit model-generating theory in this area. Nevertheless, of particular interest was probing whether and how personality mediates biological, environmental, and intellectual causes of violence, and whether it operated similarly or differently for males and females. Causal modelling will be described in more detail in a later section prior to the discussion of these results.

Missing Data. Group means (i.e., means for violent girls, nonviolent girls, violent boys, nonviolent boys) were substituted for missing values for every variable except sex, age, and race (variables with more than 20% missing data were excluded from analyses). Tabachnick and Fidell (1989) support this procedure, stating that it has "a lot to recommend it" (p.64) in that it is not as liberal as using a well-educated guess and not as conservative as inserting overall mean values.

Biological Variables

A between subjects sex by violence MANOVA on biological variables (Table 1) produced no significant effects (Wilks' criterion = .984, $F(3, 161) = .854$, $p = .47$; Wilks' criterion = .976, $F(3,161) = 1.334$, $p = .27$; Wilks' criterion = .998, $F(3,161) = .102$, $p = .959$ for the sex, violence and sex by violence interaction effects respectively). Similar results were found when family adversity variables were partialled.

Family Adversity Variables

Profile Analysis of Family Adversity Variables. The means and standard deviations for the family adversity variables are shown in Table 2. Profile analysis of these variables produced a significant sex by family adversity profile interaction (Wilks' criterion = .88; $F(8,156) =$

Table 1. Biological Variables

	Females		Males	
	Nonviolent Mean (SD)	Violent Mean (SD)	Nonviolent Mean (SD)	Violent Mean (SD)
Birth	.19 (.34)	.23 (.37)	.19 (.36)	.24 (.40)
Premat	.26(1.24)	.09(1.57)	.05(1.44)	-.38(1.71)
Wt	117.2 (13.9)	119.6 (18.4)	123.3 (19.2)	122.7 (22.9)
Dis	.35 (.44)	.27 (.39)	.40 (.47)	.33 (.46)

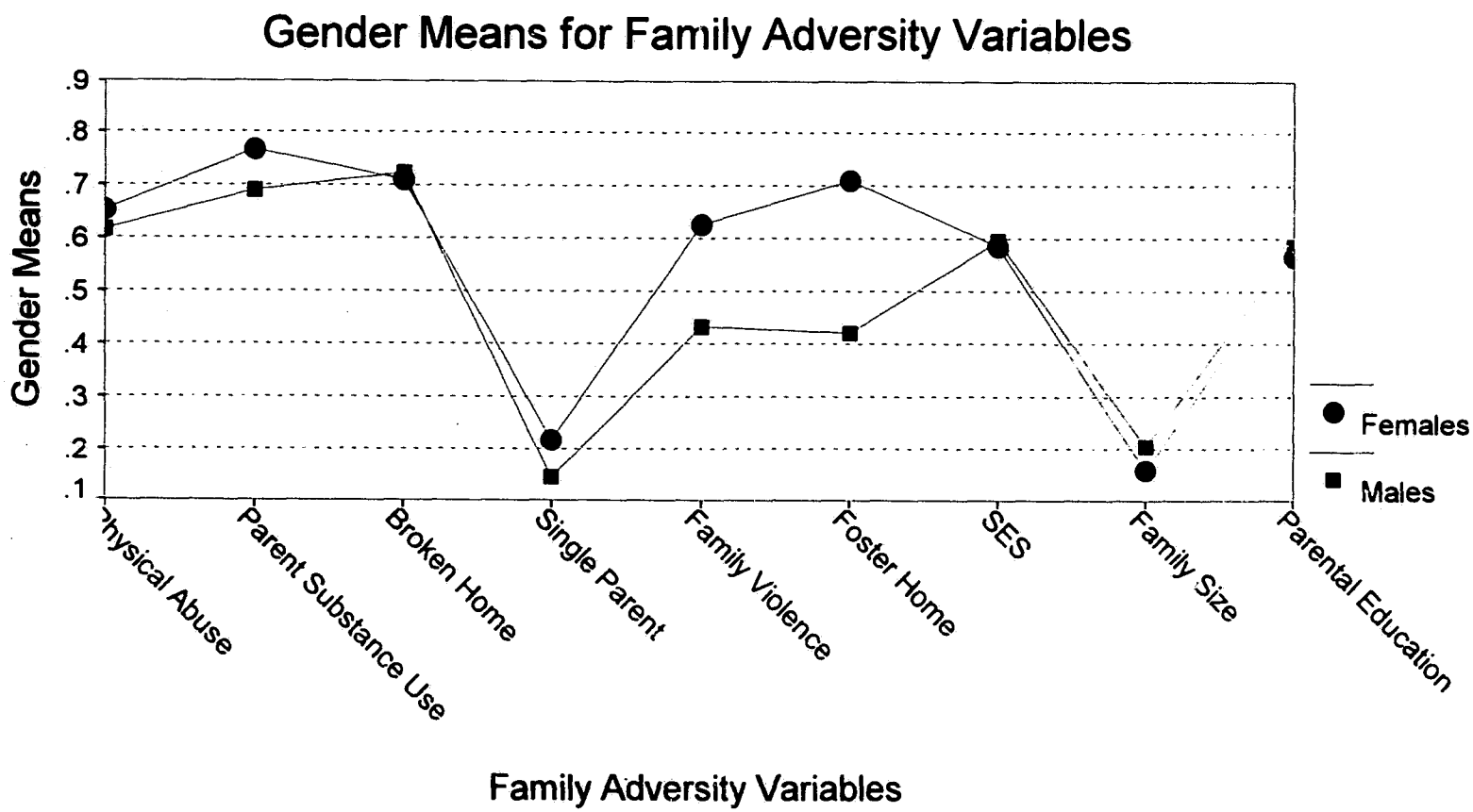
Birth = Birth Complications; Premat = Premature birth; Wt = Birth weight in ounces; Dis = Childhood diseases.

Table 2. Family Adversity Variables

	Females		Males	
	Nonviolent Mean (SD)	Violent Mean (SD)	Nonviolent Mean (SD)	Violent Mean (SD)
Phys Ab	.58 (.44)	.76 (.40)	.57 (.47)	.67 (.46)
Parent Sub	.72 (.41)	.83 (.35)	.68 (.43)	.69 (.43)
Broken Home	.69 (.47)	.74 (.44)	.71 (.46)	.74 (.44)
Singl Par	.15 (.36)	.31 (.47)	.12 (.33)	.17 (.38)
Fam Viol	.56 (.41)	.71 (.42)	.33 (.39)	.56 (.46)
Foster	.75 (.44)	.66 (.48)	.39 (.49)	.46 (.51)
SES	.50 (.48)	.70 (.46)	.54 (.50)	.66 (.48)
Fam Size	.14 (.33)	.18 (.38)	.18 (.39)	.23 (.43)
Parent Ed	.48 (.35)	.69 (.42)	.55 (.40)	.62 (.45)

Phys Ab = Physical Abuse; Parent Sub = Parental Substance Abuse; Singl Par = Single Parent; Fam Viol = Family Violence; Foster = Foster Home Placement; Fam Size = Family Size; Parent Ed = Parental Education

Figure 2

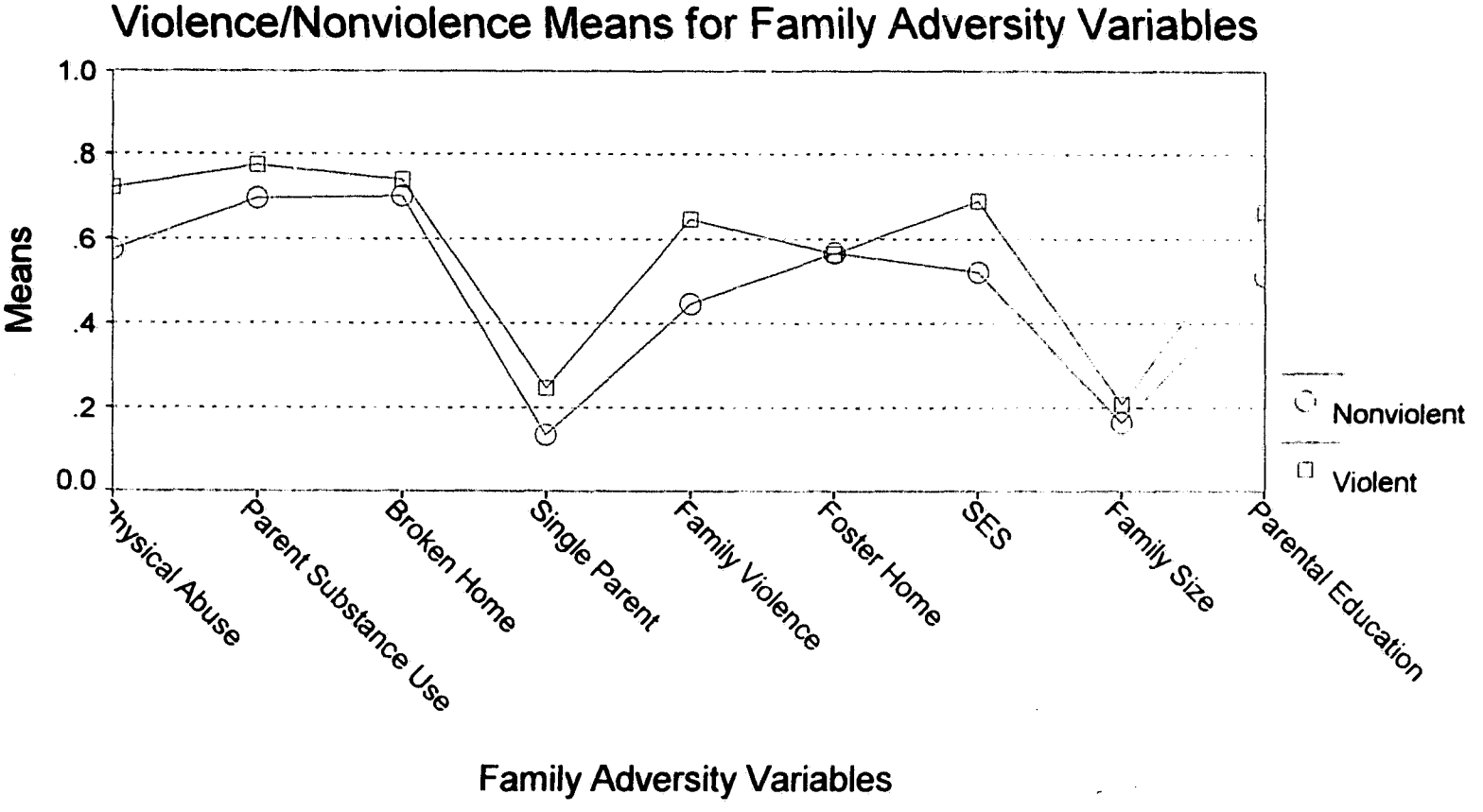

Gender Means for Family Adversity Variables
Gender Means
.9
.8
.7
.6
.5
.4
.3
.2
.1
Physical Abuse
Parent Substance Use
Broken Home
Single Parent
Family Violence
Foster Home
SES
Family Size
Parental Education
Females
Males
Family Adversity Variables

2.66, $p < .01$). As can be seen in Figure 2, the effect was primarily due to females scoring higher than males on witnessing family violence (63.8% versus 44.7%), and foster/group home placement (70.4% versus 42.2%; $p < .005$ for both variables). There were no significant differences for the remaining family adversity variables.

A significant violence main effect ($F(1,163) = 8.34$, $p < .005$), indicated that, on average, violent offenders had a more adverse family environment than nonviolent offenders (family adversity means were .58 and .48 for the violent and nonviolent offenders, respectively). A MANOVA carried out to isolate which family adversity variables were most different between nonviolent and violent offenders (Figure 3) found significant differences on physical abuse (57.4% versus 71.1% respectively; $p < .05$), witness to family violence (44.8 % versus 63.7% respectively; $p < .005$), SES (52.1% versus 68.0% respectively; $p < .05$), and parental education (51.3% versus 65.5% respectively; $p < .05$). Notice that high scores on SES and parental education indicate lower SES and parental education, so that overall the pattern of results indicate a more adverse family environment for violent offenders.

Profile Analysis of Family Adversity Variables With Biological Variables Partialled. Partialling biological variables did not change this pattern of results, indicating a direct effect of family adversity on violence.

Figure 3


Violence/Nonviolence Means for Family Adversity Variables
Means
1.0
.8
.6
.4
.2
0.0
Physical Abuse
Parent Substance Use
Broken Home
Single Parent
Family Violence
Foster Home
SES
Family Size
Parental Education
Nonviolent
Violent
Family Adversity Variables

Profile Analysis of Family Adversity Factors. The preceding analyses on the family adversity variables, although relatively easy to understand due to their high face validity, are less complex when reduced to factors. Principle components analysis produced a three factor solution that accounted for 61 percent of the total variance. The resulting factor loadings are shown in Table 3. One family adversity variable was deleted prior to this solution (family size) as it did not load on any of the factors in a preliminary analysis.

The first factor, labelled the "Abuse Factor" primarily consisted of physical abuse, parental substance abuse, and witness to family violence. The second factor, or the "Foster Home Factor" included born to single parent and foster/group home placement. The third factor, termed the "SES Factor" comprised SES and parental education (again recall that SES and education are inversely coded such that a high score, or a score closer to one, indicates lower SES and parental education level). Means and standard deviations of the family adversity factors are shown in Table 4.

A profile analysis of the above three factor solution essentially matched the results of the previous analysis, but in a condensed form. The sex by adversity profile interaction was duplicated (Wilks' criterion = .95, $F(2,162) = 4.11$, $p < .02$; Figure 4) and indicated that females as

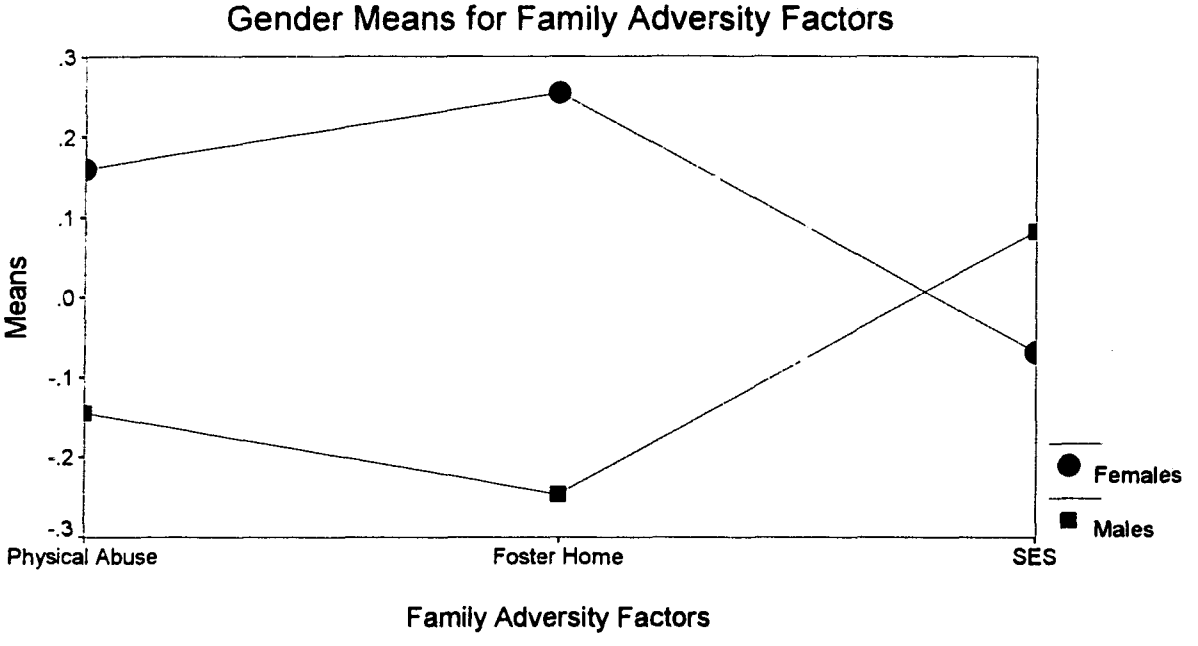
Table 3. Family Adversity Factors

	1	2	3
Physical Abuse	.718	-.017	-.024
Parental Substance Use	.759	-.116	.190
Broken Home	.521	.011	.191
Single Parent	-.266	.786	.158
Family Violence	.707	.296	.191
Foster Home	.376	.694	-.094
SES	.168	.207	.806
Parental Education	.159	-.105	.837
Percent of Total Variance Explained	26.617	15.694	18.663

Table 4. Group Means for Family Adversity Factors

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
1	.075	(.898)	.277	(.947)	-.262	(1.062)	-.013	(1.046)
2	.197	(.905)	.335	(1.173)	-.349	(.921)	-.116	(.902)
3	-.312	(.891)	.264	(.860)	-.012	(1.022)	.180	(1.153)

Figure 4


Gender Means for Family Adversity Factors
.3
.2
.1
.0
-.1
-.2
-.3
Means
Physical Abuse
Foster Home
SES
Family Adversity Factors
Females
Males

opposed to males were more likely to have come from an abusive environment ($p < .05$) and be placed in one or more foster or group homes ($p < .005$).

The main effect of violence was also duplicated ($F(1, 163) = 9.27$, $p < .005$), indicating that violent offenders scored higher on each of the three family adversity factors than nonviolent offenders (Figure 5).

Profile Analysis of Family Adversity Factors with Biological Variables Partialled. As was the case for the individual family adversity scores, repeating the analysis of family adversity factors with the effects of biological variables removed did not change the results.

Wechsler Intelligence Scale Scores

Full Scale IQ. A 2 X 2 ANOVA indicated a significant sex by violence level interaction on the Wechsler Full Scale IQ (FIQ) scores ($F(1,163) = 3.692$, $p = .05$), such that the difference on FIQ between nonviolent males and females was not significant ($p = .72$), but there was a significant difference on FIQ between violent males and females ($p < .005$; refer to Table 5).

FIQ with Other Variables Partialled. When the above analyses were repeated with biological, family adversity, and personality (MAPI and MMPI) variables partialled, the sex by violence interaction became nonsignificant ($F(1,118) = .348$, $p = .56$). However, a main effect of violence

Figure 5

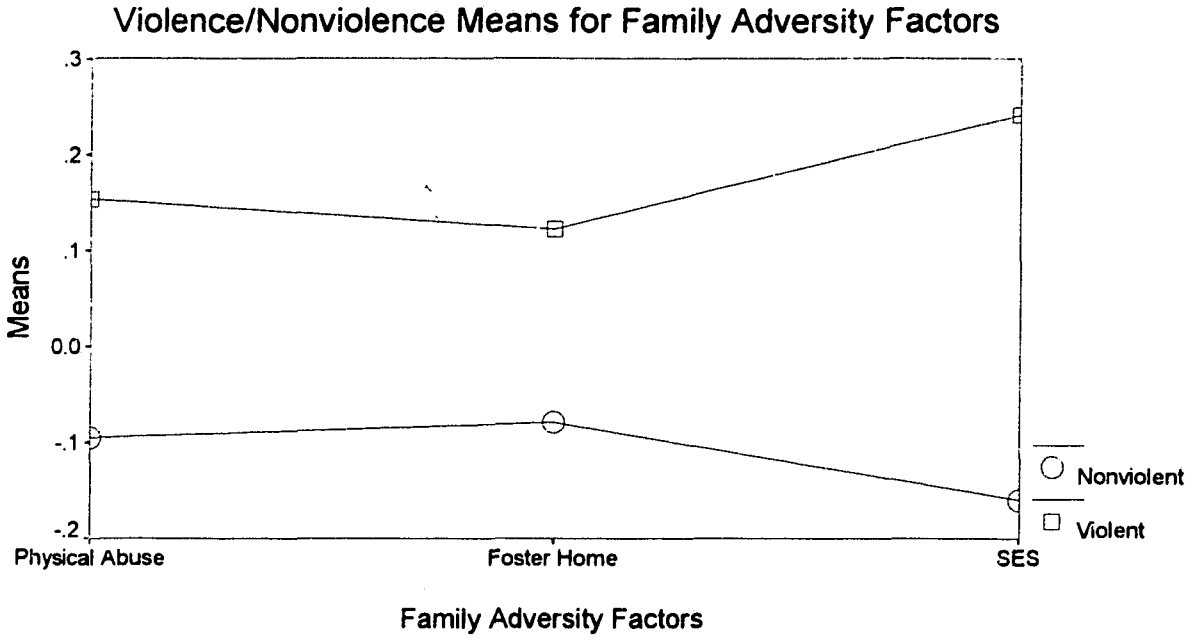

Violence/Nonviolence Means for Family Adversity Factors
Means
.3
.2
.1
0.0
-.1
-.2
Physical Abuse
Foster Home
SES
Nonviolent
Violent
Family Adversity Factors

Table 5. Wechsler IQ Scores

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
VIQ	93.4	(11.1)	91.3	(9.9)	95.0	(12.0)	98.4	(13.4)
PIQ	100.3	(13.3)	98.2	(11.8)	100.0	(12.7)	105.8	(14.6)
FIQ	96.3	(11.4)	94.1	(9.6)	97.2	(11.9)	101.8	(12.4)

appeared ($F(1,118) = 3.87$, $p = .05$), indicating that on average, violent offenders have a higher mean FIQ score than nonviolent offenders (adjusted FIQ means: 99.6 and 95.6, respectively).

Profile Analysis of Verbal and Performance IQ's. Table 5 presents means and standard deviations for Verbal IQ (VIQ) and Performance IQ (PIQ). The profile analysis produced a significant two-way interaction between sex and violence ($F(1,163) = 4.03$, $p < .05$), indicating that, on average, there was no sex difference in intelligence for the nonviolent group but that in the violent group, males scored higher than females (Figure 6). This result was consistent with that reported for FIQ.

As seen in Figure 7 the discrepancy between PIQ and VIQ was significant over the total sample ($F(1,163) = 41.85$, $p < .0001$), with PIQ (mean = 101) higher than VIQ (mean = 94.5). The interaction between violence and VIQ/PIQ discrepancy was not significant ($F(1,163) = .344$, $p = .34$), which was unexpected given that previous research has suggested a greater VIQ/PIQ discrepancy for violent offenders.

Profile Analysis of VIQ and PIQ with Biological, Family Adversity, and Personality Variables Partialled. The significant interaction between sex and violence level discussed above became nonsignificant when biological, family adversity, and personality variables were partialled ($F(1,138) = .405$, $p = .53$). This is not surprising, given

Figure 6

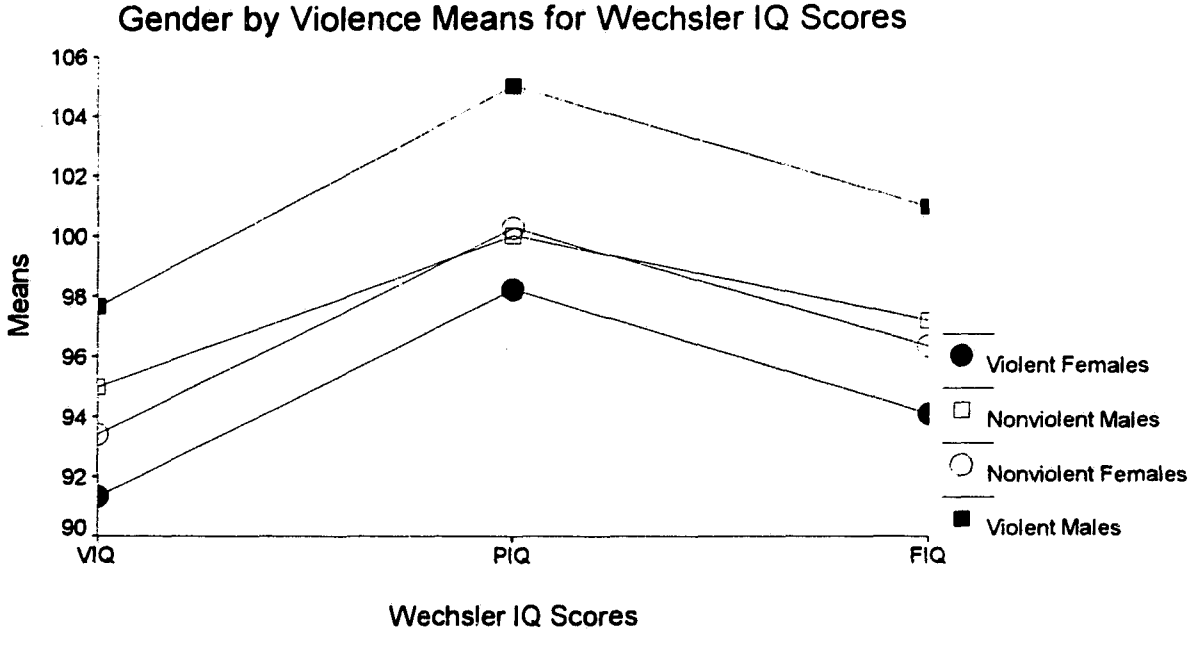
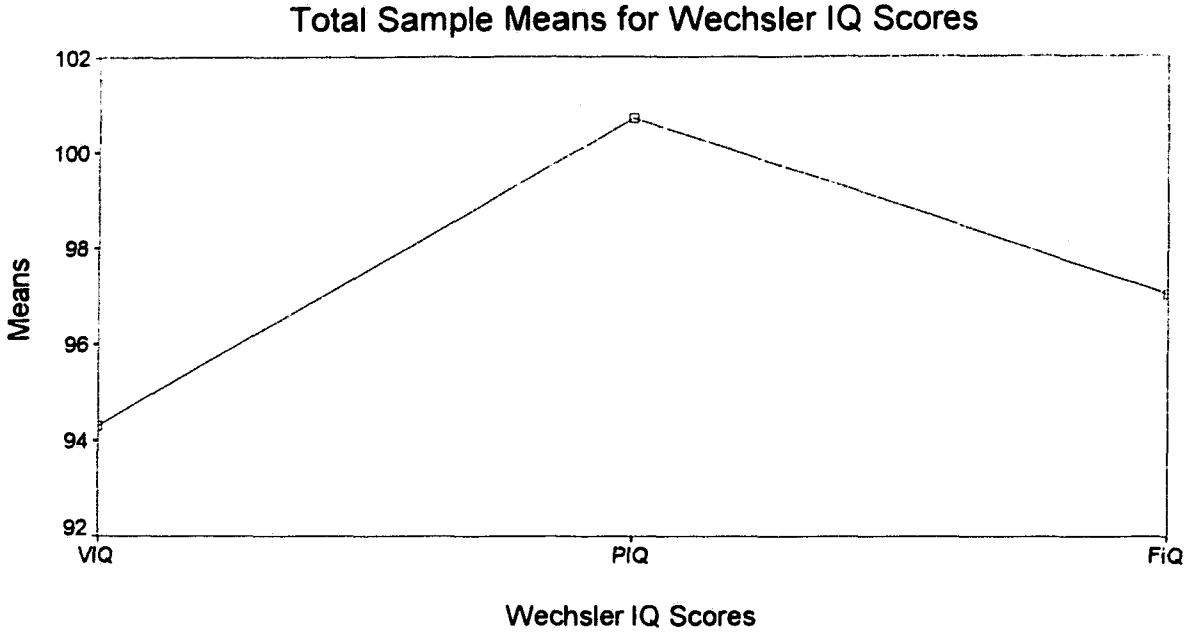

Gender by Violence Means for Wechsler IQ Scores
106
104
102
100
98
96
94
92
90
Means
VIQ
PIQ
FIQ
Wechsler IQ Scores
Violent Females
Nonviolent Males
Nonviolent Females
Violent Males

Figure 7


Total Sample Means for Wechsler IQ Scores
102
100
98
96
94
92
Means
VIQ
PIQ
FIQ
Wechsler IQ Scores

that the same was true for FIQ. Also, as with FIQ, when the other variable sets were partialled, a (near)significant result emerged for the main effect of violence ($F(1,118) = 3.60$, $p = .06$), revealing that violent offenders obtained a higher mean on the average of the VIQ/PIQ scores than nonviolent offenders (adjusted VIQ/PIQ means: 100 and 96.2, respectively).

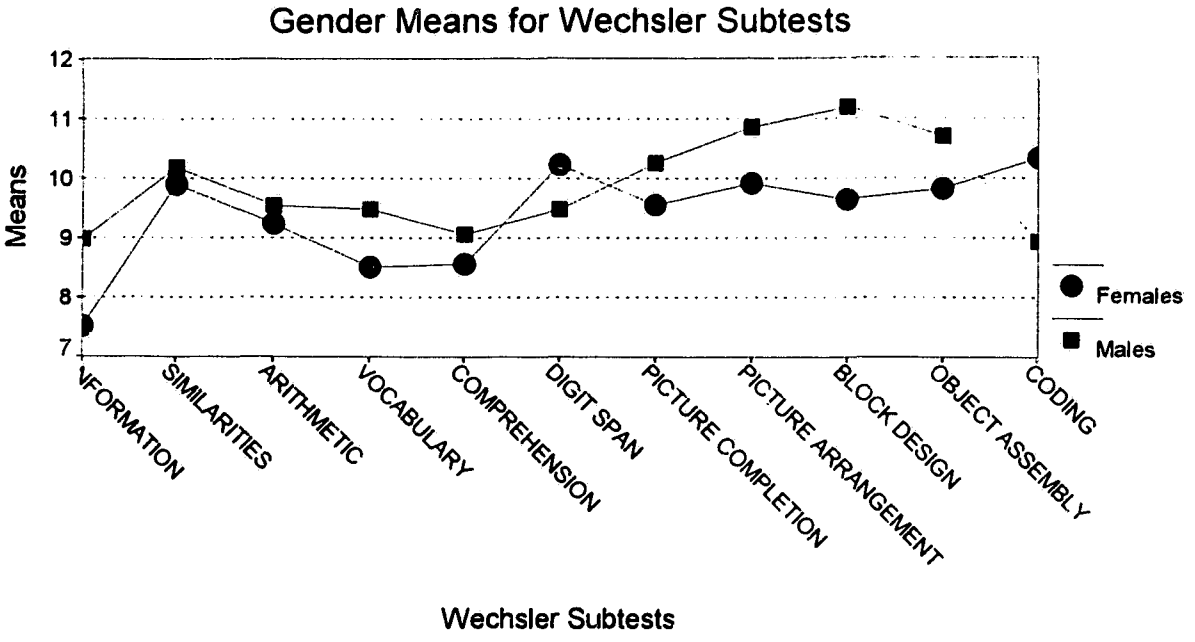
Profile Analysis of Wechsler IQ Subtests. The means and standard deviations of the 11 Wechsler subtests are presented in Table 6. A profile analysis of these data found a significant sex by subtest profile interaction (Wilks' criterion = .70, $F(10,154) = 6.70$, $p < .0001$), indicating that females and males showed a significantly different pattern of high and low scores on the Wechsler subtests (Figure 8). Specifically, males scored higher than females on Information ($p < .001$), Vocabulary ($p < .004$), Picture Arrangement ($p < .007$), Block Design ($p < .001$), and Object Assembly ($p < .025$). The females, on the other hand, scored higher than the males on Coding ($p < .003$). These findings are consistent with those reported above, where males were reported to score higher, on average, on FIQ, PIQ, and VIQ.

Profile Analysis of Wechsler Subtests with Biological, Family Adversity, and Personality Variables Partialled. When biological, family adversity, and personality variables were partialled, a sex by subtest profile interaction was

Table 6. Wechsler Subtests Scores

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Information	7.8	(2.4)	7.2	(2.1)	8.8	(2.4)	9.4	(2.8)
Similarities	10.0	(2.2)	9.7	(2.3)	10.2	(2.2)	10.3	(2.5)
Arithmetic	9.5	(2.6)	8.[illegible]	(2.3)	9.3	(2.3)	10.0	(2.9)
Vocabulary	8.5	(2.4)	8.6	(1.6)	9.2	(2.4)	10.1	(2.8)
Comprehension	8.9	(2.3)	8.2	(2.7)	8.5	(3.0)	9.5	(2.3)
Digit Span	10.1	(3.4)	10.4	(2.8)	9.4	(2.7)	9.7	(2.5)
Picture Completn	9.3	(2.9)	9.9	(2.8)	10.1	(2.0)	10.5	(2.6)
Picture Arrgment	10.2	(3.0)	9.6	(2.0)	10.5	(2.5)	11.5	(2.8)
Block Design	9.7	(2.5)	9.5	(3.0)	11.0	(3.1)	11.6	(3.2)
Object Assembly	9.7	(3.2)	10.1	(2.3)	10.3	(2.7)	11.6	(3.6)
Coding	11.0	(2.4)	9.5	(2.5)	8.7	(2.8)	9.4	(2.3)

Figure 8


Gender Means for Wechsler Subtests
Means
12
11
10
9
8
7
VFORMATION
SIMILARITIES
ARITHMETIC
VOCABULARY
COMPREHENSION
DIGIT SPAN
PICTURE COMPLETION
PICTURE ARRANGEMENT
BLOCK DESIGN
OBJECT ASSEMBLY
CODING
Females
Males
Wechsler Subtests

still found, but the effect was reduced to include only the Information ($p < .02$), Block Design ($p < .05$), and Coding ($p < .05$) subtests. The direction of the effects was the same as in the unpartialled analysis.

Freedom from Distractibility Factor and Similarities Ratio. Two clinically relevant measures derived from the Wechsler intelligence scales are the Freedom from Distractibility (FD) factor and the Similarities Ratio (SR). The FD factor is created by averaging scaled scores on the Arithmetic, Digit Span, and Coding subtests. A 2X2 ANOVA indicated that there were no significant differences on the FD factor for males versus females and violent versus nonviolent offenders. The sex by violence level interaction effect approached significance ($F(1,163) = 3.3$, $p = .06$) and revealed a significant sex difference for nonviolent offenders (females scored higher than the males; 10.2 and 9.1 respectively). There were no significant sex differences for violent offenders.

The SR is calculated from a ratio of the Similarities score to the total of all the subtests (Similarities score/sum of 11 subtests X 100). A 2X2 ANOVA found no significant effects.

Personality Variables

Profile Analysis of Minnesota Multiphasic Personality Inventory. Table 7 shows the means and standard deviations for the 13 Minnesota Multiphasic Inventory (MMPI) scales.

Table 7. MMPI Variables (T Scores)

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
L	45.3	(7.5)	50.8	(9.6)	51.2	(9.1)	48.9	(8.1)
F	72.7	(17.5)	69.8	(19.5)	61.9	(13.6)	59.2	(14.6)
K	45.1	(7.8)	48.8	(9.9)	48.7	(7.7)	46.6	(8.3)
Hs	61.9	(13.3)	56.7	(15.6)	56.6	(12.5)	56.8	(11.8)
D	64.3	(9.1)	61.3	(15.5)	59.6	(9.2)	57.3	(8.2)
Hy	59.0	(11.1)	59.8	(13.0)	57.7	(9.9)	54.9	(10.2)
Pd	74.0	(7.4)	70.7	(13.2)	63.1	(10.0)	65.3	(9.6)
Mf	52.7	(9.5)	55.4	(10.0)	55.7	(10.8)	57.4	(11.4)
Pa	62.3	(8.7)	60.1	(12.9)	56.6	(9.0)	60.1	(13.5)
Pt	61.1	(10.6)	57.6	(13.2)	56.5	8.6)	56.4	(9.2)
Sc	67.1	(11.2)	63.2	(16.6)	60.1	(10.7)	57.8	(11.9)
Ma	66.5	(8.0)	60.6	(11.1)	58.6	(8.4)	62.6	(9.6)
Si	49.6	(9.3)	48.6	(10.0)	51.3	(10.4)	47.8	(9.6)

Analyses of MMPI scale profiles showed a significant three-way interaction between sex, violence, and MMPI profile T scores (Wilks' criterion = .81, $F(12, 152) = 3.02$, $p = .001$). As can be seen in Figure 9, there were sex by violence interactions on the following variables: Hypomania ($p = .001$), Lie ($p = .005$), and Correction ($p = .03$). (Recall that the names of these scales do not precisely indicate the characteristics that the scale measures; refer to page 24 for scale descriptions.)

Univariate simple effects analyses indicated that nonviolent females scored higher than nonviolent males on the Hypochondriasis, Depression, Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, Hypomania, and Frequency MMPI scales (all significant at least at $p < .05$). Nonviolent males scored higher than nonviolent females on the Lie scale ($p < .005$).

This same analysis comparing males and females, but within the violent group, revealed that violent females scored higher on the Psychopathic Deviate ($p < .05$) and Frequency ($p < .01$) scales, and marginally higher on the Hysteria ($p < .07$) and Schizophrenia ($p = .08$) scales. Violent males did not score significantly higher than violent females on any of the MMPI scales.

It is important to point out that, although the differences on various MMPI scales between groups were significant, Table 7 shows that none of the scales were

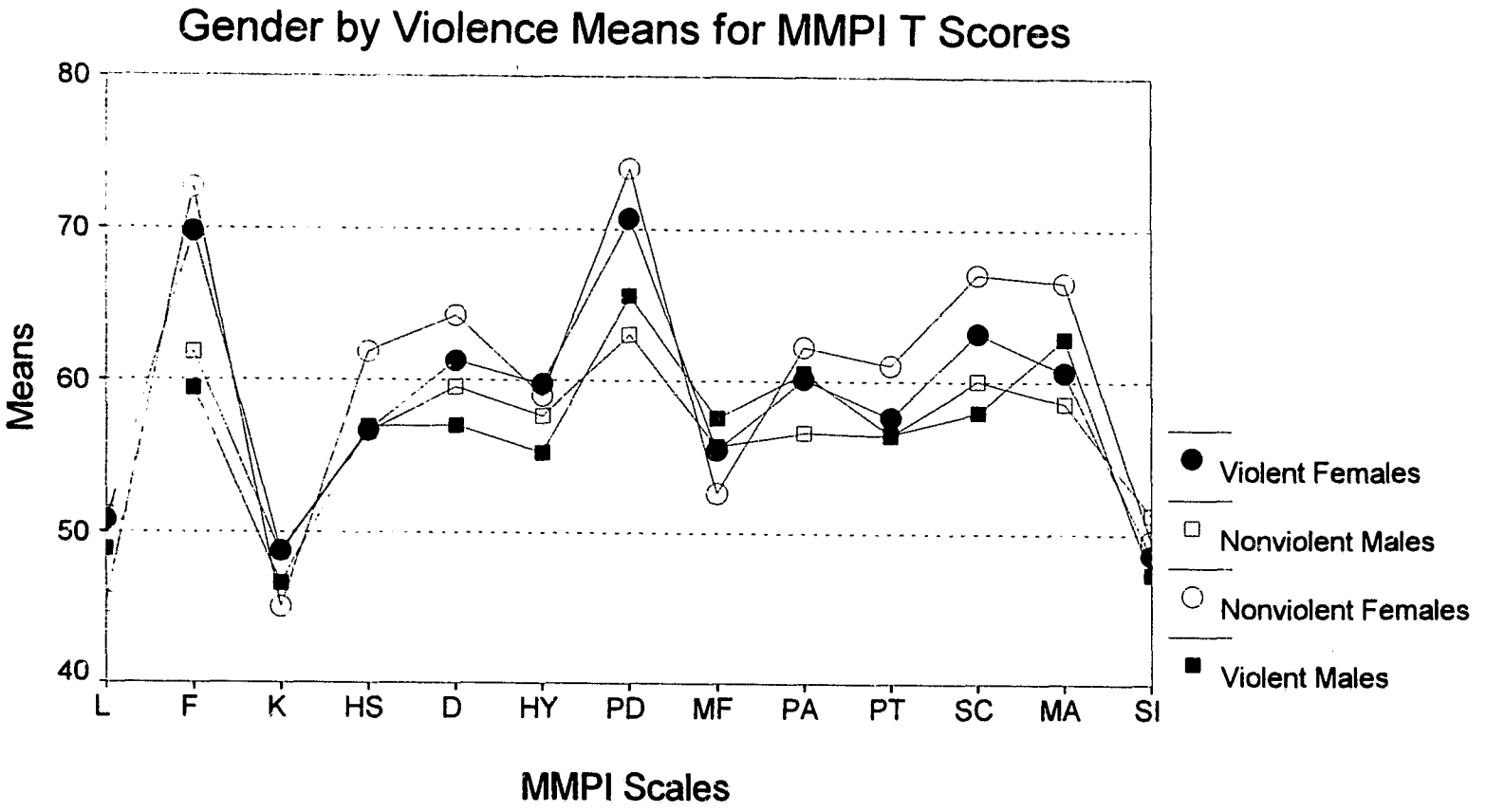
elevated above a T score of 70, with the exception of the Pd scale for both violent and nonviolent females. Therefore, the above analyses should be viewed as reflecting *trends* towards certain personality traits, rather than clinically significant personality pathology.

Profile Analysis of MMPI with Biological, Family Adversity, Intelligence, and MAPI Variables Partialled. The three-way interaction discussed above remained significant with biological, family adversity, IQ subtests, and MAPI partialled. On the Psychopathic Deviate scale, there was still a greater sex difference for the nonviolent groups (with females scoring higher; adjusted mean = 72.4; males' adjusted mean = 63.9; $p < .005$) than for violent groups (adjusted mean for females = 71.1; adjusted mean for males = 66.0; nonsignificant difference).

A greater and significant sex difference on the Frequency scale for the nonviolent groups also remained (adjusted mean for males = 51.0; adjusted mean for females = 45.6), while the difference between violent males and females on this scale was not significant (adjusted mean for females = 50.67; adjusted mean for males = 49.0).

The sex difference for the Hypomania scale approached significance for the violent groups ($p = .07$) with males scoring higher (adjusted mean = 64.0) than females (adjusted mean = 58.0). The results for this scale are somewhat different than those with none of the variables partialled,

Figure 9


Gender by Violence Means for MMPI T Scores
80
70
60
50
40
Means
L
F
K
HS
D
HY
PD
MF
PA
PT
SC
MA
SI
MMPI Scales
Violent Females
Nonviolent Males
Nonviolent Females
Violent Males

in that the difference is now greater between violent males and females, whereas with nothing partialled it was greater for nonviolent males and females. However, violent males continue to score higher than violent females on the Hypomania scale.

The remaining scale that was significant with nothing partialled (Correction scale) became nonsignificant when biological, family adversity, IQ subtest, and MAPI variables were partialled.

Profile Analysis of MMPI Factors. Principal components analysis of the MMPI scale T-scores produced the three factor solution shown in Table 8. The factor loadings suggest that many of the MMPI scales are factorially complex, i.e., they load on more than one factor. In naming the factors, labels were chosen that reflected those scales that appeared to be uniquely determined by the underlying construct.

Factor 1 - Egocentric factor: This factor has its maximal positive loadings on scales Hypochondriasis, Hysteria, Paranoia, Psychopathic Deviate, and Frequency, and reflects demanding, noninsightful, egocentric, hostile, moody, and suspicious characteristics.

Factor 2 - Denial factor: This factor loaded primarily on the Lie scale, indicating a tendency to deny psychological problems and an attempt to present an overly favorable self-image.

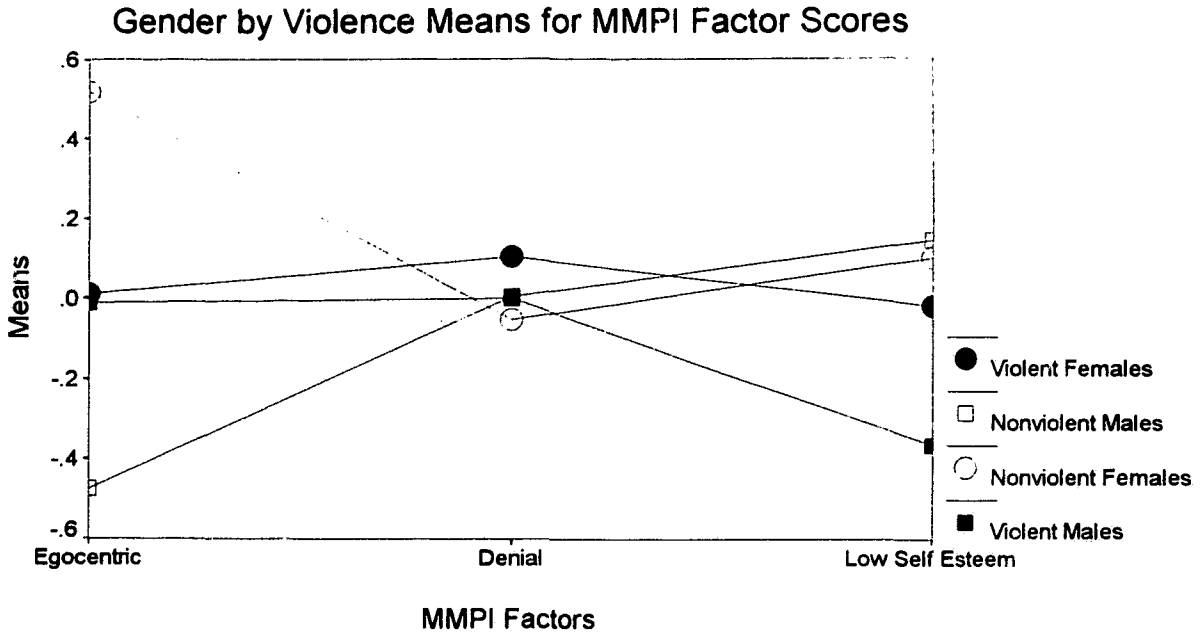
Table 8. MMPI Factors

MMPI Scale	1	2	3
L	.152	.790	.020
F	.777	-.146	.228
K	.145	.641	-.463
Hs	.786	.009	.223
D	.612	.086	.560
Hy	.769	.274	.012
Pd	.642	-.514	.119
Mf	.311	.304	-.264
Pa	.684	-.249	.101
Pt	.545	-.402	.646
Sc	.717	-.350	.478
Ma	.428	-.732	-.100
Si	.149	.038	.902
Percent of Total Variance Explained	32.494	18.304	16.875

Table 9. Group Means for MMPI Factors

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
1	.304	(.898)	.163	(1.170)	-.259	(.931)	-.222	(.935)
2	-.478	(.800)	.157	(1.110)	.397	(.902)	-.056	(1.020)
3	.031	(.916)	-.098	(1.087)	.188	(1.026)	-.208	(.974)

Figure 10


Gender by Violence Means for MMPI Factor Scores
Means
.6
.4
.2
.0
-.2
-.4
-.6
Egocentric
Denial
Low Self Esteem
MMPI Factors
Violent Females
Nonviolent Males
Nonviolent Females
Violent Males

Factor 3 - Low Self-esteem factor: The Introversion scale is the salient feature of this factor, indicating low self-esteem, shyness, withdrawal, and anxiety in social situations.

Means and standard deviations for the MMPI factors are reported in Table 9. Profile analysis of the MMPI factors (Figure 10) resulted in a significant three-way interaction (Wilks' criterion = .944, $F(2, 162) = 4.79$, $p < .01$), which supports the analysis of the 13 individual MMPI scales. Simple effects analysis reveals that for the nonviolent group, females scored higher than males on the Egocentric factor ($p < .005$), whereas no sex difference was found for the violent group. On the Denial factor, the females score lower than the males, for the nonviolent group ($p < .001$). No sex difference was found for the Denial factor in the violent group.

Profile Analysis of MMPI Factors with Biological, Family Adversity, Intelligence, and MAPI Variables Partialled. The significant interaction found for the sex by violence level by MMPI factors with no variables partialled (see previous section), remained marginally significant (Wilks' criterion = .955, $F(2,119) = 2.78$, $p = .066$) when other variables were partialled. Simple effects analysis indicated sex by violence differences only for the Denial factor. For the nonviolent offenders, the females again scored lower than the males ($p < .003$; adjusted means

Table 10. MAPI Variables (Base Rate Scores)

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
1	37.9	(19.8)	36.3	(19.5)	40.4	(21.9)	36.0	(26.1)
2	65.0	(22.1)	54.8	(22.6)	63.2	(23.7)	52.9	(19.5)
3	37.6	(19.8)	36.0	(18.8)	40.6	(28.0)	41.9	(27.8)
4	55.4	(22.9)	60.6	(23.9)	52.9	(22.8)	56.9	(21.3)
5	42.0	(17.9)	51.9	(20.4)	43.6	(20.8)	53.0	(20.3)
6	68.7	(20.3)	74.4	(16.9)	68.0	(25.4)	64.1	(29.2)
7	32.9	(18.7)	34.5	(16.1)	33.4	(18.3)	33.5	(24.8)
8	84.5	(22.3)	80.4	(19.8)	76.5	(21.3)	70.7	(26.1)
A	70.8	(18.6)	61.4	(16.4)	70.2	(15.1)	60.4	(18.2)
B	74.1	(14.8)	69.4	(16.4)	68.9	(14.0)	60.9	(19.4)
C	63.0	(17.3)	54.3	(20.3)	56.7	(21.1)	52.5	(20.7)
D	61.1	(14.0)	64.0	(13.7)	54.7	(15.2)	52.2	(18.5)
E	57.3	(17.4)	50.2	(18.3)	54.5	(21.3)	50.2	(18.2)
F	62.4	(22.2)	59.9	(19.8)	62.3	(25.4)	53.4	(26.3)
G	85.3	(18.2)	88.5	(16.7)	80.0	(19.3)	75.3	(26.4)
H	73.8	(15.8)	67.0	(20.6)	71.3	(19.2)	64.9	(23.5)
SS	68.6	(19.6)	69.6	(16.3)	69.4	(22.9)	68.9	(30.1)
TT	70.8	(21.8)	72.1	(15.9)	68.5	(20.1)	65.6	(23.4)
UU	61.2	(20.0)	56.7	(20.8)	66.1	(20.4)	59.5	(21.9)
WW	64.4	(22.1)	61.6	(17.3)	55.7	(15.7)	51.8	(14.1)

are -.477 and .177 respectively), and no sex difference was found for the violent group ($p = .31$).

Profile Analysis of Millon Adolescent Personality Inventory. Means and standard deviations for the Millon Adolescent Personality Inventory (MAPI) scales are presented in Table 10. Profile analysis of the MAPI revealed that males and females produced significantly different MAPI profiles (Wilks' criterion; $F(19,145) = 12.27$, $p < .0005$), with the females scoring higher than the males on the following scales (Figure 11): Sensitive ($p < .02$), Personal Esteem ($p < .01$), Sexual Acceptance ($p < .0001$), Family Rapport ($p < .005$), and Attendance Consistency ($p < .002$; see Appendix A for descriptions of these scales). There was also a significant difference on profiles for violent versus nonviolent offenders (Wilks' criterion; $F(19,145) = 2.090$, $p < .01$). As can be seen in Figure 12, *nonviolent* offenders scored higher than the violent offenders on the Inhibited ($p < .005$), Self-Concept ($p < .002$), Personal Esteem ($p < .02$), Body Comfort ($p < .05$), Peer Security ($p = .056$), and Academic Confidence ($p < .04$) scales. The violent offenders scored higher than nonviolent offenders on the Confident scale ($p < .003$).

Profile Analysis of MAPI with Biological, Family Adversity, Intelligence, and MMPI Variables Partialled. The two-way interactions for sex by MAPI scales held (see previous section) when other variables were partialled. Two

Figure 11

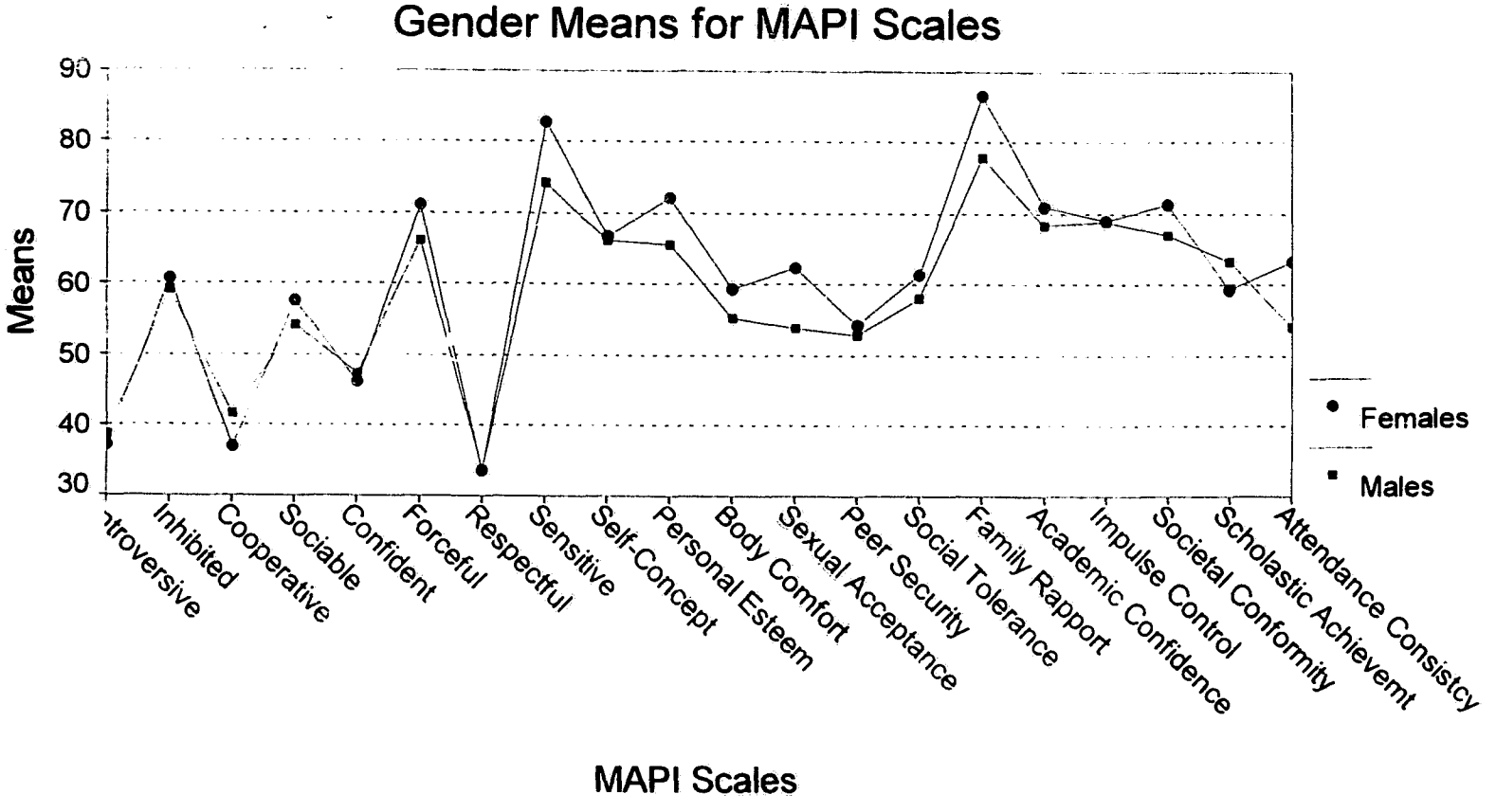
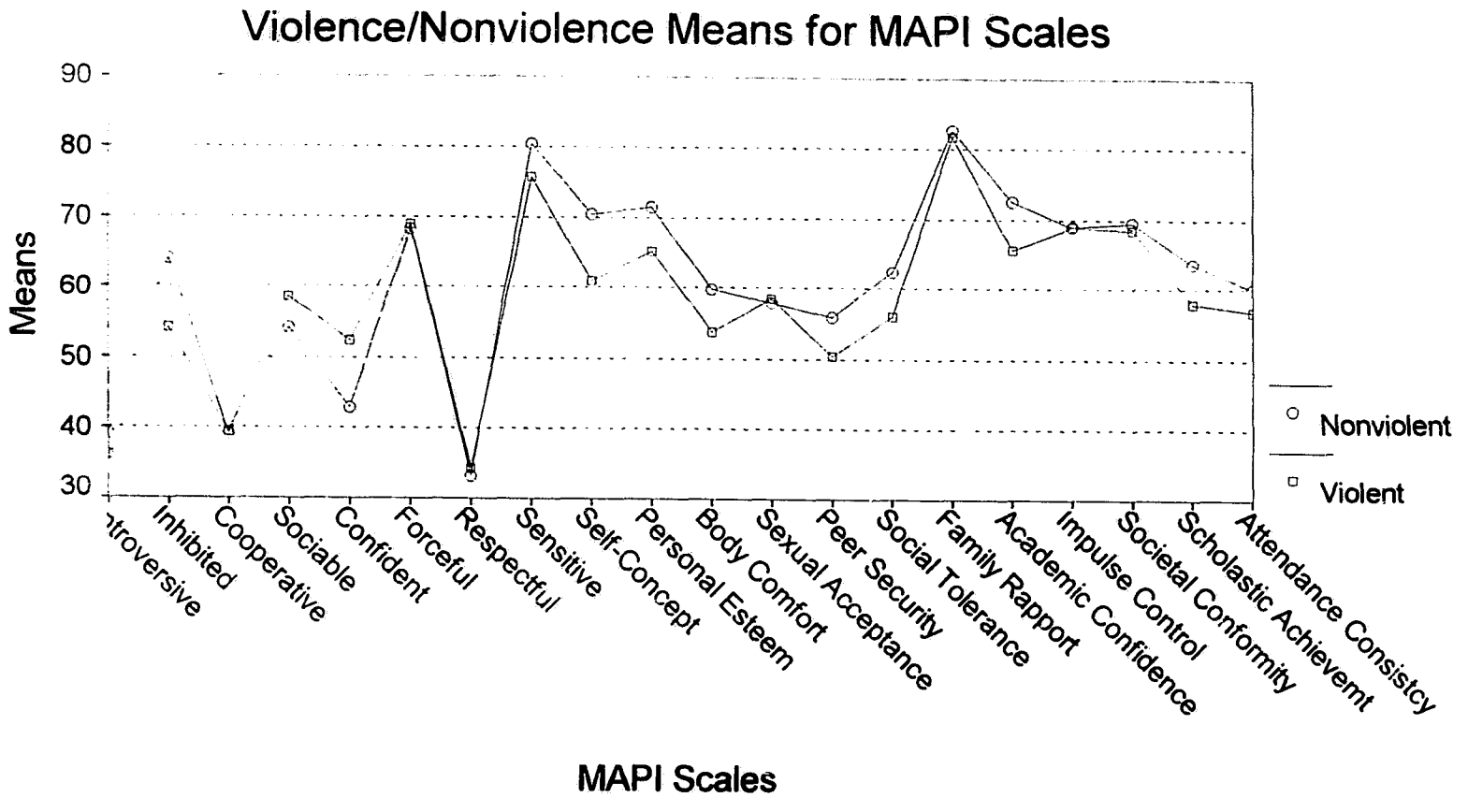

Gender Means for MAPI Scales
Means
90
80
70
60
50
40
30
Females
Males
ntroversive
Inhibited
Cooperative
Sociable
Confident
Forceful
Respectful
Sensitive
Self-Concept
Personal Esteem
Body Comfort
Sexual Acceptance
Peer Security
Social Tolerance
Family Rapport
Academic Confidence
Impulse Control
Societal Conformity
Scholastic Achievemt
Attendance Consistcy
MAPI Scales

Figure 12


Violence/Nonviolence Means for MAPI Scales
Means
90
80
70
60
50
40
30
Nonviolent
Violent
ntroversive
Inhibited
Cooperative
Sociable
Confident
Forceful
Respectful
Sensitive
Self-Concept
Personal Esteem
Body Comfort
Sexual Acceptance
Peer Security
Social Tolerance
Family Rapport
Academic Confidence
Impulse Control
Societal Conformity
Scholastic Achievemt
Attendance Consistcy
MAPI Scales

of the scales, however, became nonsignificantly different for males and females when the effects of the other variables were held constant. These were Sensitive and Family Rapport scales, where the females had scored higher with none of the other variables partialled. All other scales reported as significantly different between the sexes in the previous section remained significant after partialling the other variables.

The significant violence by MAPI profile interaction found previously disappeared when all other variables were partialled. However, the main effect of violence remained significant ($F(1, 127) = 5.04$, $p < .03$), indicating that when the 20 MAPI scale scores were averaged, nonviolent offenders (adjusted mean = 61) scored higher than violent offenders (adjusted mean = 58), independent of sex.

Profile Analysis of MAPI Factors. Principal components analysis of the MAPI, which reduced the original 20 MAPI scales to two factors, is presented in Table 11. Several of the scales on the MAPI are "reverse scored", in that high scores reflect positive characteristics (e.g., a high score on the Sociable scale reflects an outgoing and sociable disposition), whereas high scores on other scales indicate more negative characteristics (e.g., a high score on Forceful indicates domineering, blunt and impatient tendencies). Therefore, both positive and negative loadings may be important in describing those factors made up of

Table 11. MAPI Factors

	1	2
Introversive	-.344	.043
Inhibited	.205	.922
Cooperative	-.727	.319
Sociable	.254	-.722
Confident	-.081	-.925
Forceful	.860	-.176
Respectful	-.875	-.107
Sensitive	.755	.498
Self-Concept	.276	.834
Personal Esteem	.288	.745
Body Comfort	-.052	.758
Sexual Acceptance	-.191	.662
Peer Security	-.080	.781
Social Tolerance	.651	.048
Family Rapport	.829	.111
Academic Confidence	.660	.393
Impulse Control	.897	.019
Societal Conformity	.934	.077
Scholastic Achievement	.675	.464
Attendance Consistency	.445	.677
Percent of Total Variance Explained	34.571	32.089

scales that are not factorially complex.

Factor 1 - Rebellious factor: This factor is bipolar with the positive pole defined by loadings on the Forceful, Family Rapport, Impulse Control, and Societal Conformity scales. Individuals with characteristics indicated by the positive pole of this factor are typically described as domineering, strong-willed, impatient, and impulsive. An attempt to put a strong image forward, with a fear of being seen as weak and concern about what others think is also indicated. Additionally, family relations are conflictual, and there is little perceived emotional support within the family constellation. Finally, this factor also indicated a tendency to disregard societal regulations. The negative pole of this factor indicates a lack of concern for doing what is "right" and "proper" and a preference for "breaking rules".

Factor 2 - Withdrawal factor: This factor was also bipolar, and was defined primarily by positive loadings on Inhibited, Self-Concept, Body Comfort, and Peer Security. These scales reflect social awkwardness, poor self concept, dissatisfaction with appearance, and perceived rejection by peer group. The negative pole of this factor included high loadings on Confident and Sociable, indicating lack of self-assuredness and a tendency to be shy and ill-at-ease in social situations.

Means and standard deviations for the MAPI factors are

Table 12. Group Means for MAPI Factors

	Females				Males			
	Nonviolent		Violent		Nonviolent		Violent	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
1	.078	(.917)	.096	(.807)	-.015	(.993)	-.183	(1.275)
2	.269	(.964)	-.154	(1.042)	.076	(.960)	-.322	(.985)

Figure 13

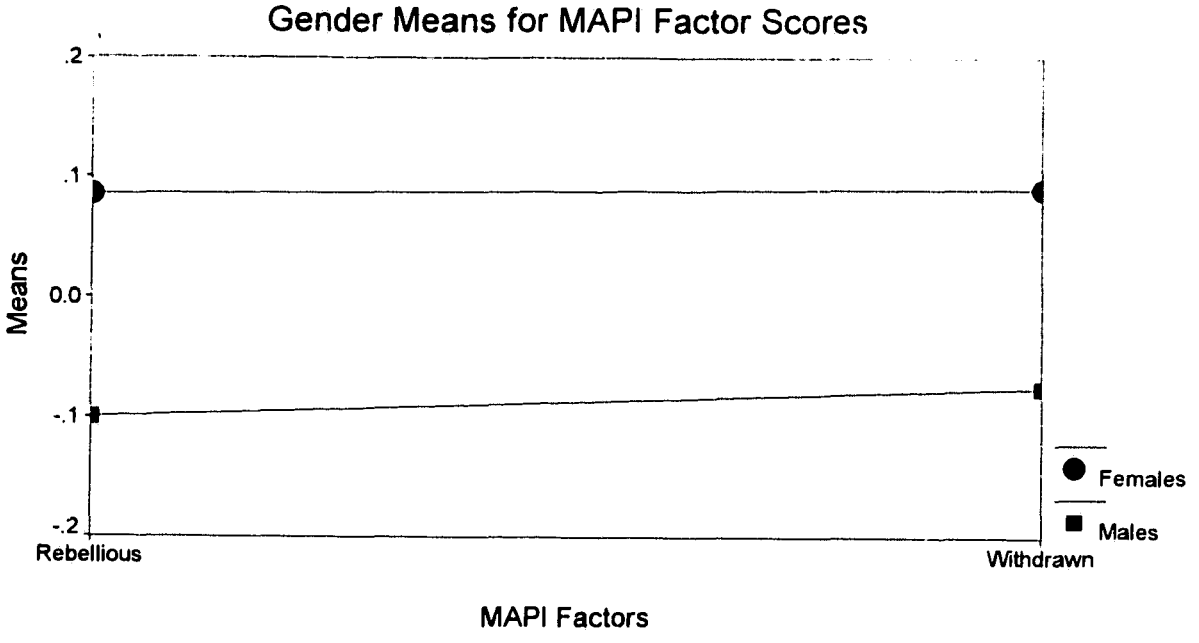
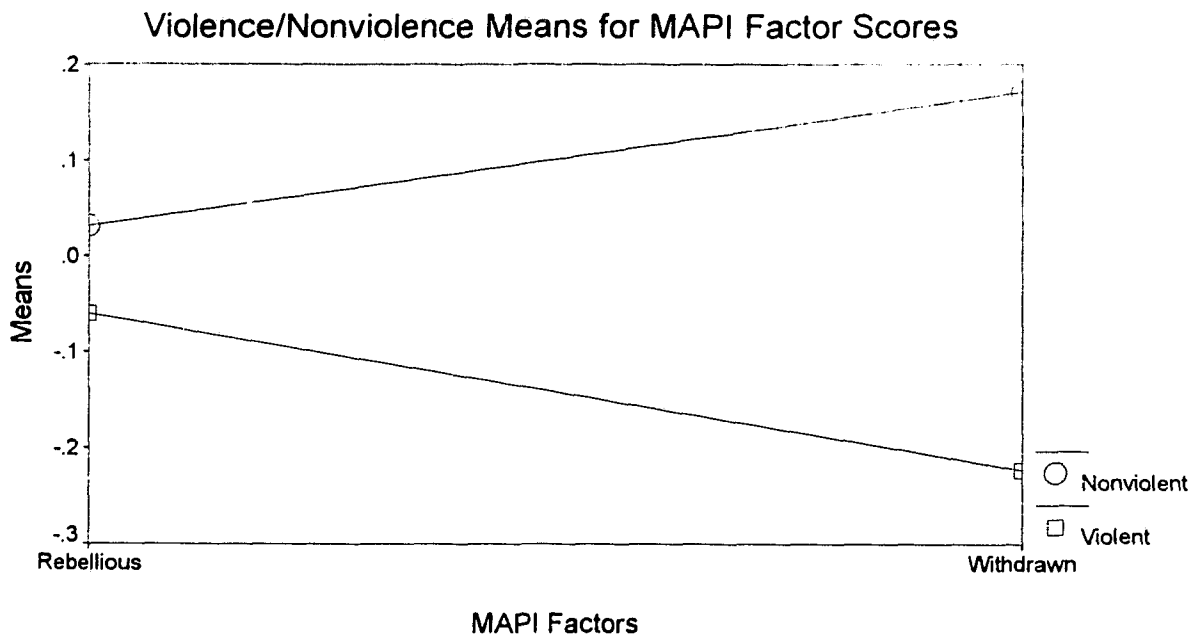

Gender Means for MAPI Factor Scores
.2
.1
0.0
-.1
-.2
Means
Rebellious
Withdrawn
MAPI Factors
Females
Males

Figure 14


Violence/Nonviolence Means for MAPI Factor Scores
.2
.1
.0
-.1
-.2
-.3
Means
Rebellious
Withdrawn
MAPI Factors
Nonviolent
Violent

presented in Table 12. A main effect of sex approached significance ($F(1, 163) = 2.81$, $p = .096$), indicating that females scored higher than the males on the average of the two MAPI factors (Figure 13). A significant main effect for violence/nonviolence was found ($F(1,163) = 4.92$, $p < .03$), revealing that nonviolent offenders scored higher on the average of the MAPI factors than violent offenders (Figure 14).

Profile Analysis of MAPI Factors with Biological, Family Adversity, Intelligence, and MMPI Variables Partialled. The results of the analyses for the MAPI factors reported in the previous section showed an important change when biological, family adversity, IQ subtest variables, and MMPI factors were partialled. Both the sex difference "trend" (i.e., difference approached significance) and the significant violence effect disappeared. Otherwise, previous results were replicated with the above mentioned variables partialled.

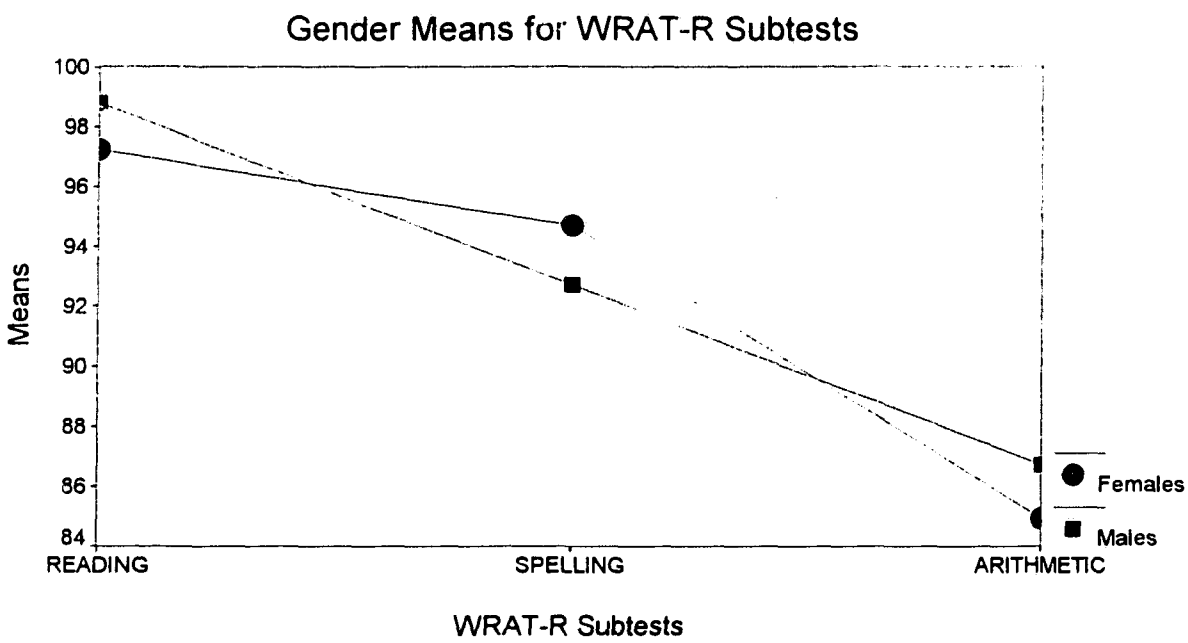
Wide Range Achievement Test - Revised (WRAT-R)

Profile Analysis of WRAT-R Subtests. Means and standard deviations for WRAT-R subtests are presented in Table 13. Profile analysis of WRAT-R variables (Reading, Spelling, Arithmetic) indicated that the WRAT-R profiles deviated significantly from parallelism for gender (Wilks' criterion = .95, ($F(2,162) = 4.27$, $p < .02$). Males and females showed

Table 13. WRAT-R Scores and Number of Grades Failed

	Females		Males	
	Nonviolent	Violent	Nonviolent	Violent
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Reading	97.1(12.3)	97.4 (9.8)	96.0(12.2)	102.2(14.4)
Spelling	95.1(13.6)	94.1 (9.1)	90.0(12.8)	95.9(13.2)
Arithmetic	84.4(15.5)	85.7(13.6)	84.0(15.6)	89.8(14.1)
No. Grades Failed	.54(.64)	.29(.50)	.59(.72)	.54(.66)

Figure 15


Gender Means for WRAT-R Subtests
100
98
96
94
92
90
88
86
84
Means
READING
SPELLING
ARITHMETIC
WRAT-R Subtests
Females
Males

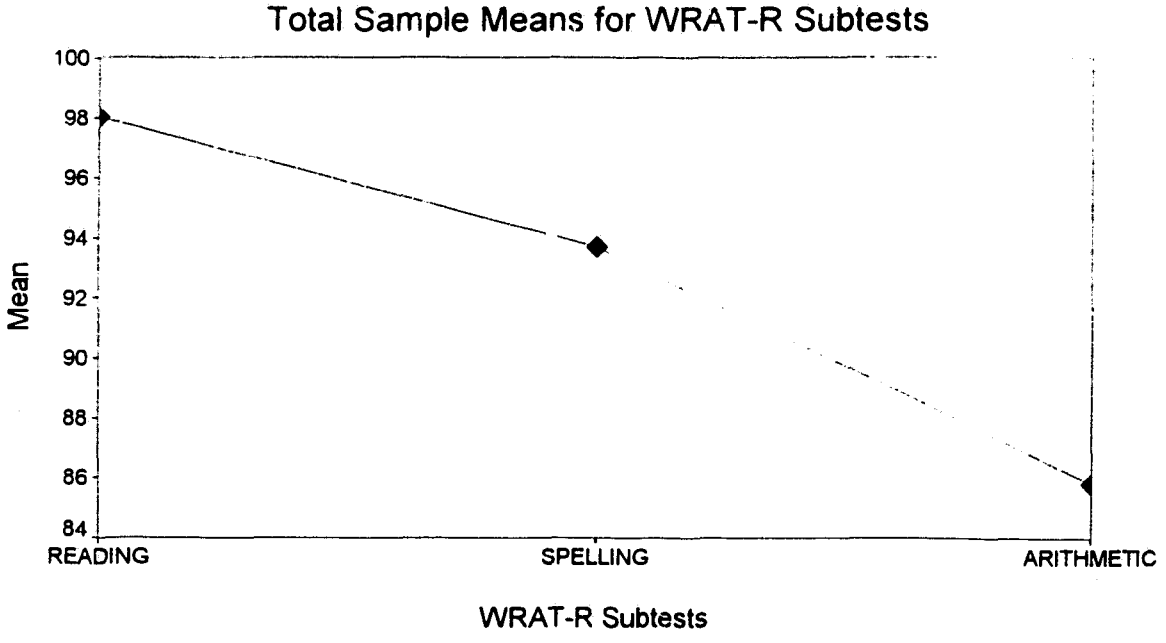
a significantly different pattern of high and low WRAT-R scores (Figure 15). Males scored higher than females on Arithmetic and Reading, while females scored higher than males on Spelling. There were no significant differences between violent and nonviolent offenders on WRAT-R scores.

For the levels test, no reliable differences were found among groups when scores were averaged across the three WRAT-R subtests. However, as shown in Figure 16, when averaged over groups, subtests were found to deviate significantly from flatness (Wilks' criterion = .569 $F(2,162) = 56.61$, $p < .0001$). Reading is the highest WRAT-R score for the total sample (mean = 97.90), followed by Spelling (mean = 93.56) and Arithmetic (mean = 85.68). Single sample z tests against population means of 100 with a standard deviation of 15 showed that Spelling ($z = -5.55$, $p < .01$) and Arithmetic ($z = -12.34$, $p < .01$) WRAT-R scores were significantly lower than population values, while Reading was not ($z = -.1.81$, $p > .05$).

Academic underachievement was determined by comparing WRAT-R scores with FIQ scores. Profile analysis indicated that there were no significant group differences on this measure.

Profile Analysis of WRAT-R Subtest Scores with Biological, Family Adversity, Intelligence, and Personality Variables Partialled. The above significant interaction between WRAT-R scores and gender (parallelism) disappears when

Figure 16


Total Sample Means for WRAT-R Subtests
100
98
96
94
92
90
88
86
84
Mean
READING
SPELLING
ARITHMETIC
WRAT-R Subtests

biological, family adversity, and personality variables are partialled. However, a significant main effect of violence emerges ($F(1,107) = 10.908$, $p = .001$). The violent offenders score higher on the average of the three WRAT-R subtests (adjusted mean = 95.6) than the nonviolent offenders (adjusted mean = 90.1).

The three WRAT-R subtests, when averaged over groups, no longer deviated significantly from flatness with the other variables partialled.

School Failure

A 2 X 2 ANOVA indicated that there were no significant differences among the four groups in terms of number of grades failed in school (Table 13). However, when biological, family adversity, intelligence, and personality variables were partialled, a significant three-way interaction emerged ($F (1,108) = 3.789$, $p. = .05$). Violent males had a proportionally higher rate of school grade failures than violent females (adjusted means: .73 and .04 respectively), whereas there was no significant gender difference for the nonviolent groups (adjusted means for females = .50; males = .68). The higher number of school failures for the violent males versus violent females is surprising, given that previous analyses indicated that the violent males scored significantly higher on intelligence measures than the violent females.

Substance Abuse

A 2 X 2 ANOVA of the substance abuse variable revealed a significant main effect for sex ($F(1, 163) = 24.46$, $p < .0001$), indicating that females (mean = 2.53) scored higher than males (mean = 1.57). This significant effect held with all other variables partialled (adjusted means: females = 2.58; males = 1.52).

Summary of Profile Analysis Results

The general theme of profile analyses indicated that violent offenders, independent of gender, experienced a more adverse family environment than nonviolent offenders, particularly with respect to higher levels of physical abuse, witnessing more family violence, lower SES, and lower parental education. Additionally, violent offenders surprisingly showed higher Wechsler IQ scores than nonviolent offenders. This was particularly true for males. Personality test analyses (using the MAPI) also produced unexpected results, in that violent offenders had higher self-esteem and felt less rejected by their peer group.

Overall differences between males and females when combined as a group (i.e., violent and nonviolent offenders) generally reflected that females scored higher on family adversity Abuse and Foster Home factors. Females also tended to score lower than males on Wechsler IQ scores, and WRAT-R Arithmetic and Reading scores. Personality test

results indicated that females were typically less well-adjusted than the males. However, the males more often attempted to present an overly favorable self-image and a defensive test-taking attitude.

Causal Modelling of Violence in Males and Females

Path analysis was used to evaluate the nature and extent of potential causes of juvenile violence. Due to the absence of explicit theory in this area, especially theory that relates personality dimensions to juvenile violence, the orientation of the analysis was exploratory (hypothesis generating) rather than confirmatory (hypothesis testing).

The analysis proceeded in four steps. First, an analysis of Denno's (1990) model (see Figure 1, page 35) was run simultaneously as well as separately on the male and female adolescents. This model relates biological variables, family adversity, and SES to violence through intellectual status and school achievement, but does not include personality dimensions. The second step used modification indices from the first analysis in an attempt to improve the models. The objective of these two steps was to provide a backdrop for evaluating the contribution of personality dimensions to models of adolescent violence. That is, after generating reasonable models based on biology, family adversity, intellectual status and school achievement, personality dimensions were incorporated into

the model as additional mediators of violence. This addition of personality dimensions constituted step three of the analysis. At this point the contribution of personality dimensions to the prediction of violence beyond the contribution of biology, family adversity, intellectual status and school achievement could be evaluated. Additionally, this step provided a rough idea of whether and how including personality dimensions would affect already existing paths relating biology, family adversity, intellectual status and school achievement to violence.

In the final step, modification indices from the analysis comprising step three were used to refine the models of violence for males and females. Whereas step three provided a gross evaluation of the impact of personality on the model, step four explored the possibility of more complex interconnections among all classes of variables in the model.

General features of the analyses. There are two commonly used forms of causal modelling; path analysis and latent variable structural equation modelling (LVSEM). The primary difference is that path analysis evaluates causal models using single indicators of each construct, whereas LVSEM uses multiple indicators to form latent variables (factors) of each construct. In essence, the latent variable approach combines factor analysis (called the measurement model) with path analysis (called the structural

model) in a single simultaneous analysis. The analysis used in the present study represents a hybrid of these two approaches. That is, path analyses were performed in which some of the constructs used are factors, but they are factors derived earlier using principal components analysis (e.g., family adversity components and personality components). The reason for this approach is that the number of subjects was not sufficient to simultaneously fit a measurement model and a structural model.

In presenting diagrams of causal models the following conventions were followed. Curved, double-headed arrows are used to denote correlations between predictor constructs (also called exogenous constructs). These correlations represent undirected relationships between constructs whose causes are outside (not explained by) the model. For example, in Figure 1 family adversity, SES, and biology are modeled as causes of intelligence, but are not themselves explained by the model. Straight, single-headed arrows denote structural (path) coefficients, which are similar in character to regression weights. They represent directed causal relations between constructs, in which the construct from which the arrow originates is the cause and the construct at which the arrow ends is the effect. Effects are like dependent variables in regression analysis and are often called endogenous variables in modelling terminology. However, unlike regression analysis where dependent

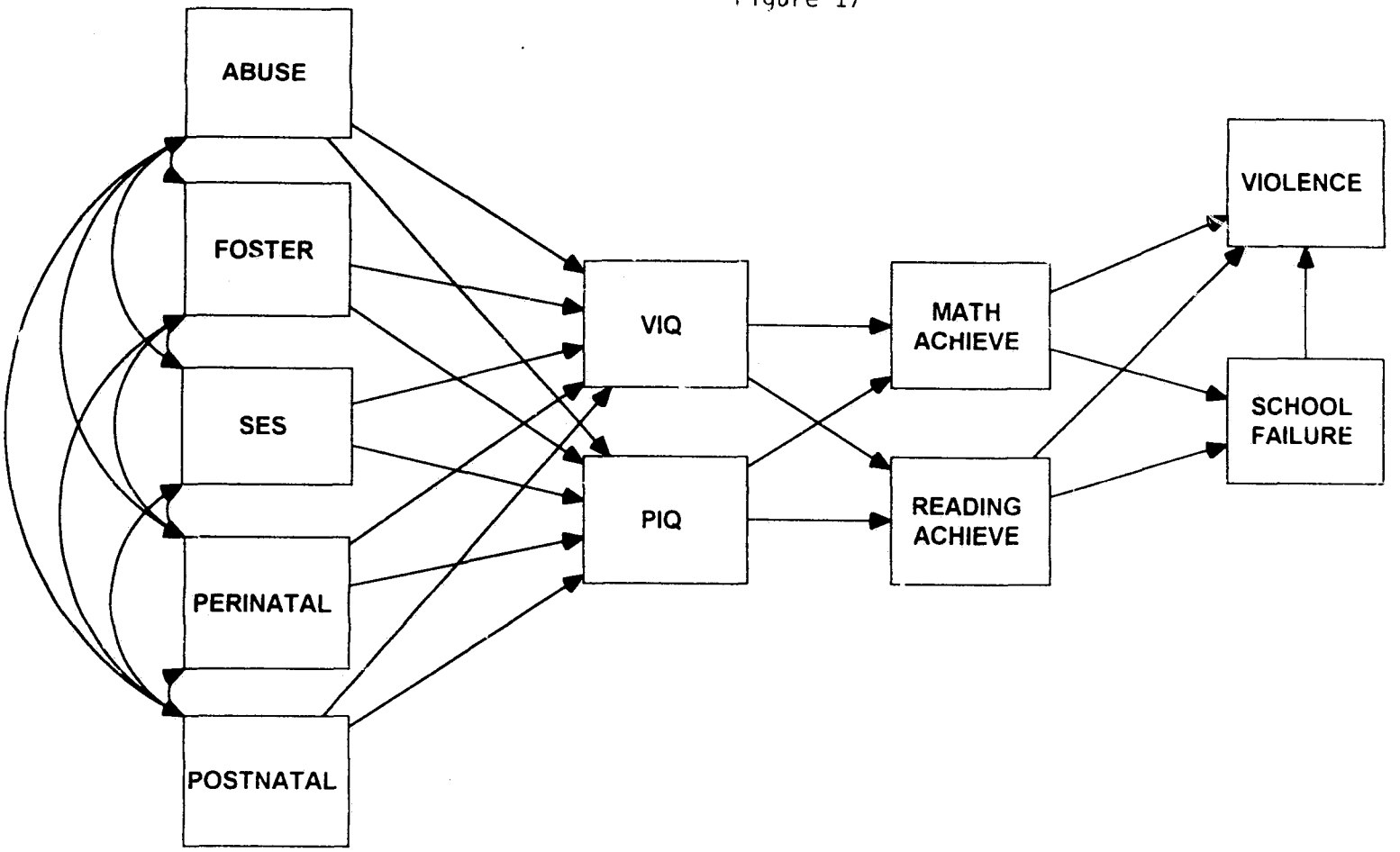
variables are only effects, in causal modelling some variables can be both effects and causes. For example in Figure 1, intelligence is caused by family adversity, SES and biology, and is itself a cause of school achievement.

One diagramming convention was not preserved. For each effect in a causal model there is an associated prediction error. These errors are generally omitted in order to avoid perceptual clutter. Notice, however, that when constructs come from the same instrument (e.g., VIQ, PIQ), the error terms are correlated due to shared measurement error. Such correlated errors were incorporated in the models but are not shown. The only exception to this rule is when the prediction errors of very different constructs (e.g., achievement and violence) are correlated, in which case the correlated errors are illustrated.

All models were run using the program Analysis of Moment Structures (AMOS), Arbuckle (1992). Statistics reported include chi-square, and the adjusted goodness of fit index (AGFI). Path drawings are reported using standardized path coefficients, and include the squared multiple correlation (proportion of variance explained) for violence on the upper left side corner of the corresponding rectangle.

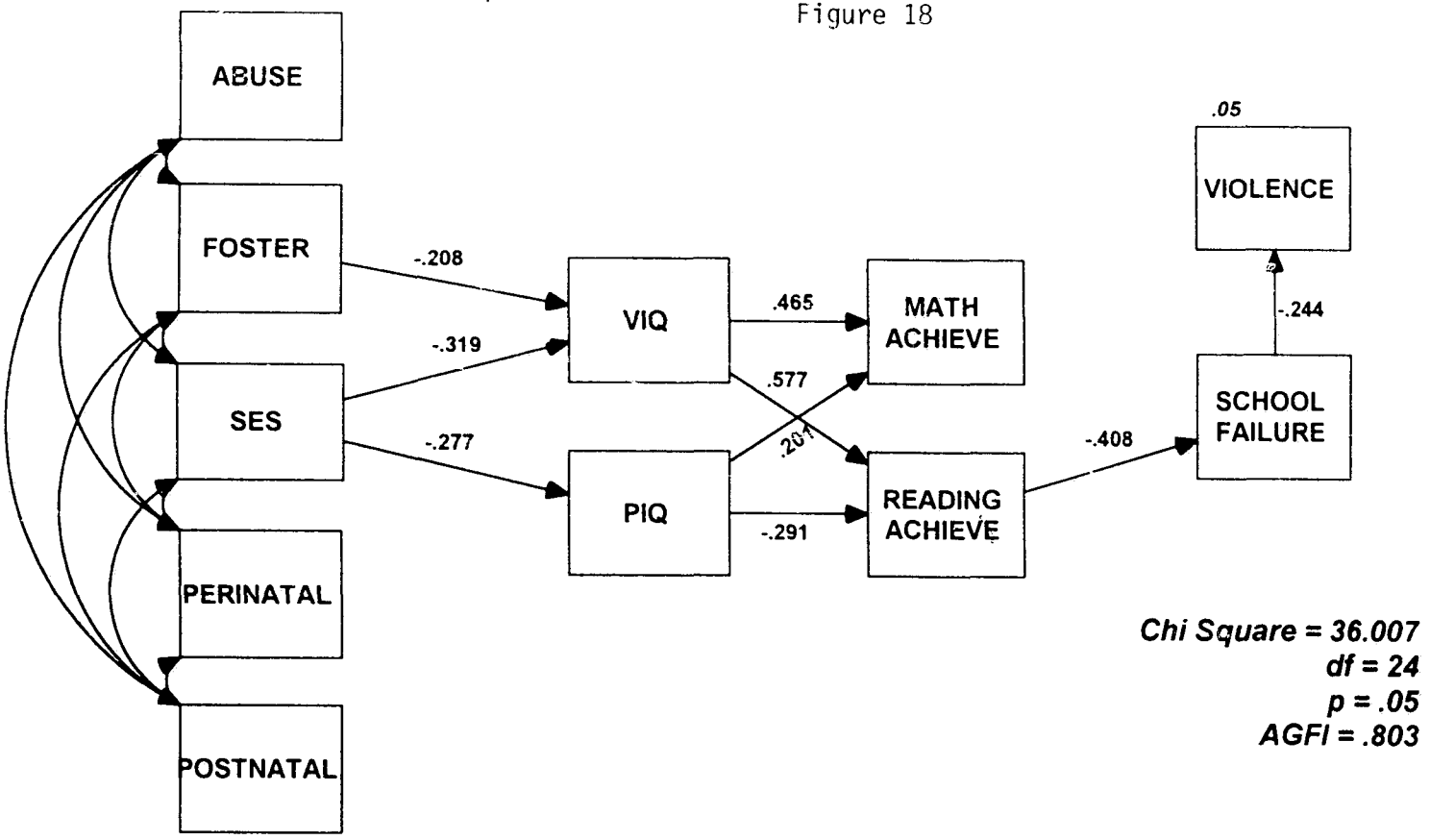
Steps 1 and 2 -- An evaluation and modification of Denno's model of adolescent violence. An adaptation of Denno's (1990) model incorporating the variables used in the

Figure 17



DENNO'S MODEL OF VIOLENCE USING CURRENT STUDY'S VARIABLES. (NOTE: ERROR TERMS ARE OMITTED. ALSO CORRELATIONS BETEEN THE ERRORS OF MEASURES ARISING FROM THE SAME TEST (E.G., VIQ AND PiQ) ARE OMITTED.

Figure 18

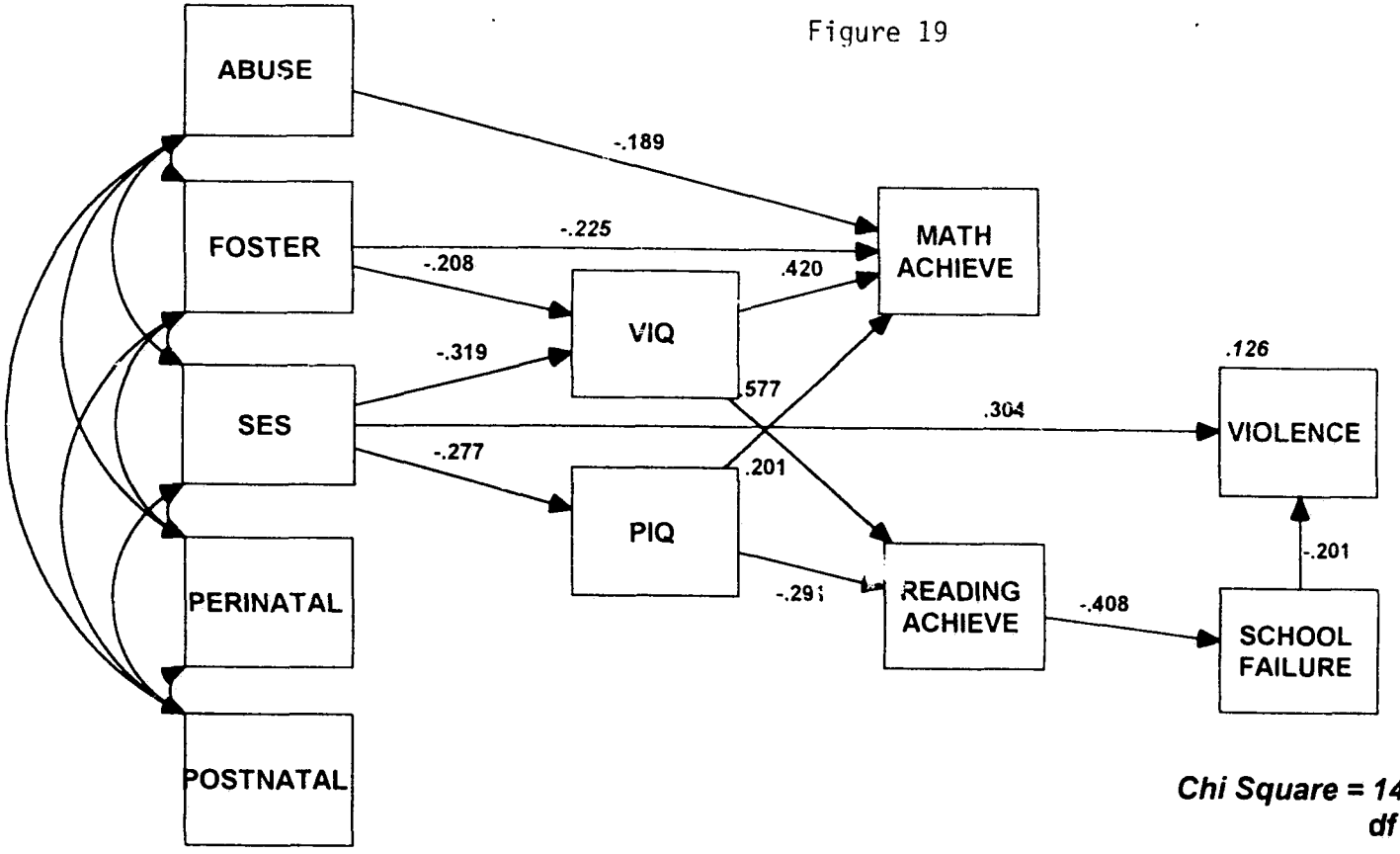


DENNO'S MODEL APPLIED TO THE FEMALE GROUP. NONSIGNIFICANT PATHS HAVE BEEN OMITTED

present study is shown in Figure 17. A multiple group analysis in which both males and females are evaluated simultaneously showed a reasonable fit of Denno's model ($\chi^2(48) = 53.60$, $p = .27$, AGFI = .86). However, subsequent analyses showed that the path coefficients differed between the two groups, and that the overall reasonable fit was due to combining a good fit for the males with a poor fit for the females. Thus, separate models for males and females were run.

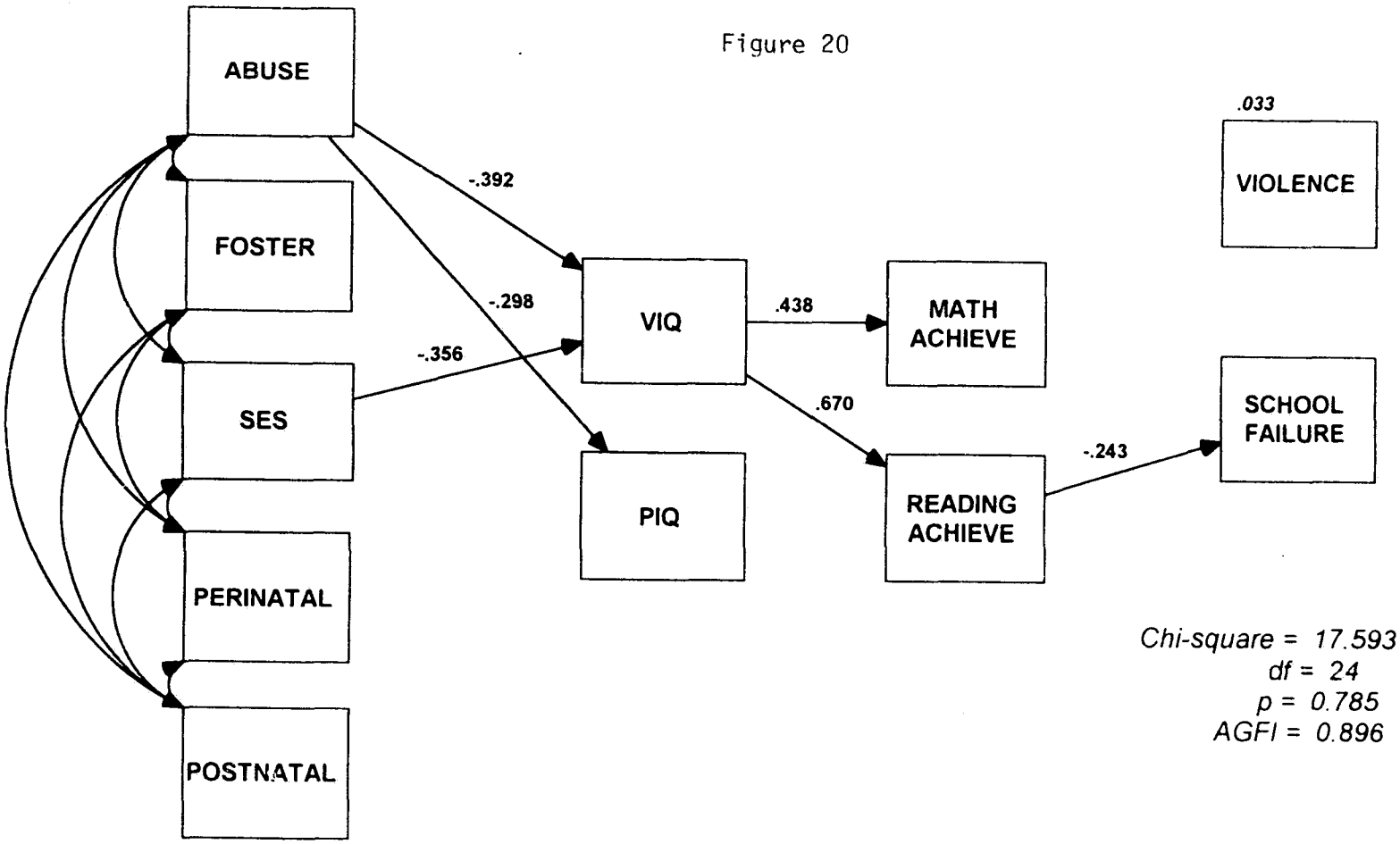
The results of applying Denno's model to the females alone are shown in Figure 18. The results indicate a poor fit ($\chi^2 = 36.007$, $p = .05$, AGFI = .803), which according to modification indices is due to the exclusion of paths from the variables foster and abuse to math, and SES to violence. When these paths were added to produce the model shown in Figure 19, the fit was improved ($\chi^2(21) = 14.23$, $p = .86$, AGFI = .91) and the variance accounted for in violence increased from 5% to 12.6 %. The most salient aspect of this model is the effect of SES on violence, both directly and indirectly through VIQ, PIQ, reading achievement, and school failure. The final path from school failure to violence is somewhat perplexing, but consistent with the results reported earlier. That path indicates a higher incidence of violent offenses among girls who do <u>not</u> fail in school. The effect of foster home placement on one of the measures of school achievement (i.e., math) provides partial

Figure 19



MODIFIED DENNO'S MODEL APPLIED TO THE FEMALE GROUP. NONSIGNIFICANT PATHS HAVE BEEN OMITTED

Figure 20



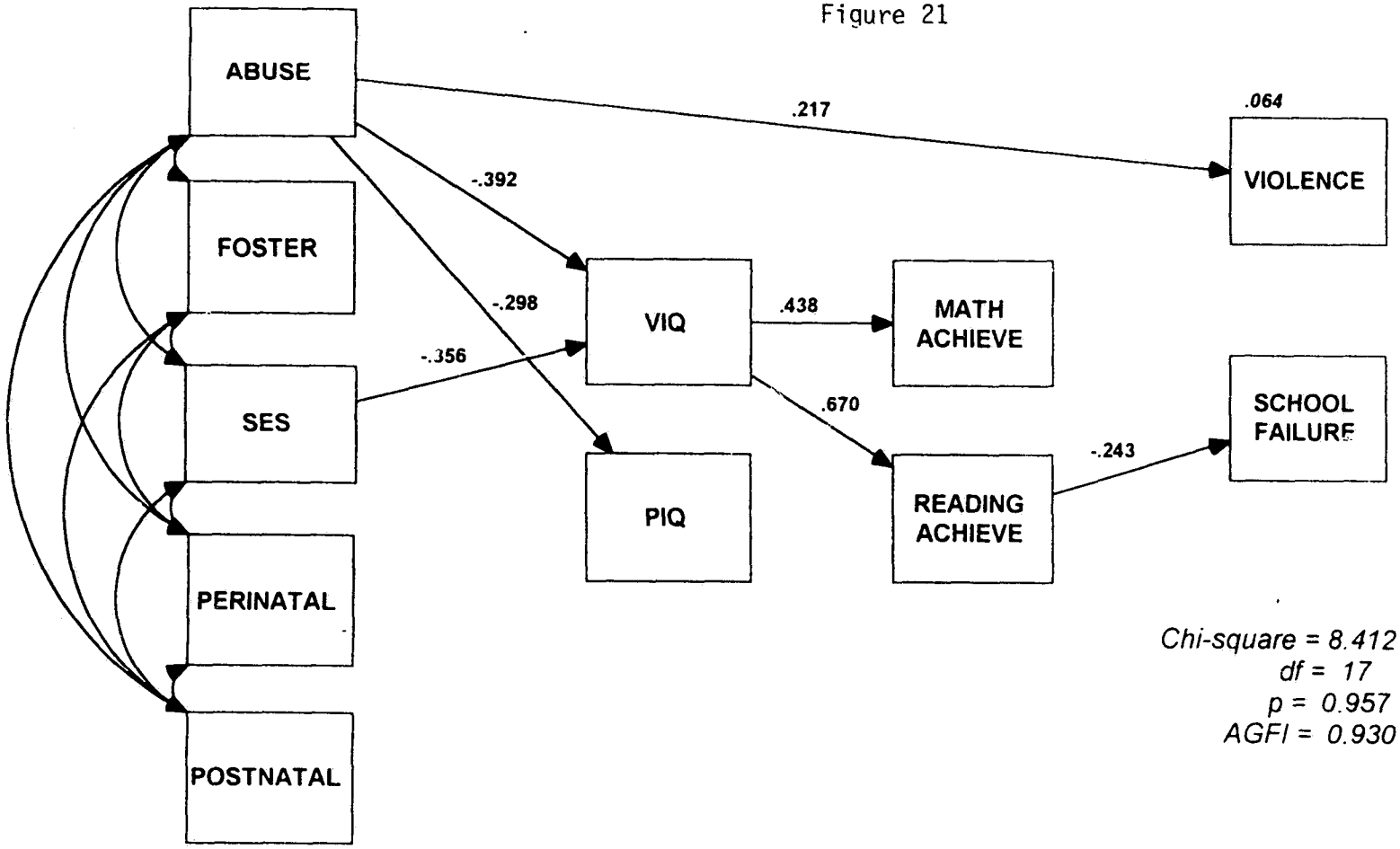
DENNO'S MODEL APPLIED TO THE MALE GROUP. NONSIGNIFICANT PATHS HAVE BEEN OMITTED.

support for Denno's (1990) findings. However, math achievement does not link with violence either directly or indirectly. Finally, the lack of a significant direct or indirect relationship between violence and either the perinatal or postnatal variables suggests that biological variables may not be important causes of violence in female adolescents.

The results of applying Denno's model to the male group are shown in Figure 20. The model provided a good fit ($\chi^2(24) = 17.593$, $p = .785$, AGFI = .90), although there were no significant paths to the major variable of interest, namely violence. In order to see if Denno's model could be modified to incorporate violence at all, the model was run with all direct effects to violence included. The resulting model ($\chi^2(17) = 8.41$, $p = .957$, AGFI = .93) is shown in Figure 21. Compared to the females, abuse seems to be the predominant cause of violence for males, as well as having a relatively strong direct effect on intelligence and an indirect effect on school achievement and school failure. In the end, however, Denno's model and indeed this set of variables does not provide a very compelling explanation of violence among adolescent offenders, with even the modified model accounting for only 6% of the variance in violence.

Steps 3 and 4 -- Incorporating personality variables with biological, family, intellectual and school achievement variables. Using the modified models based on biological,

Figure 21

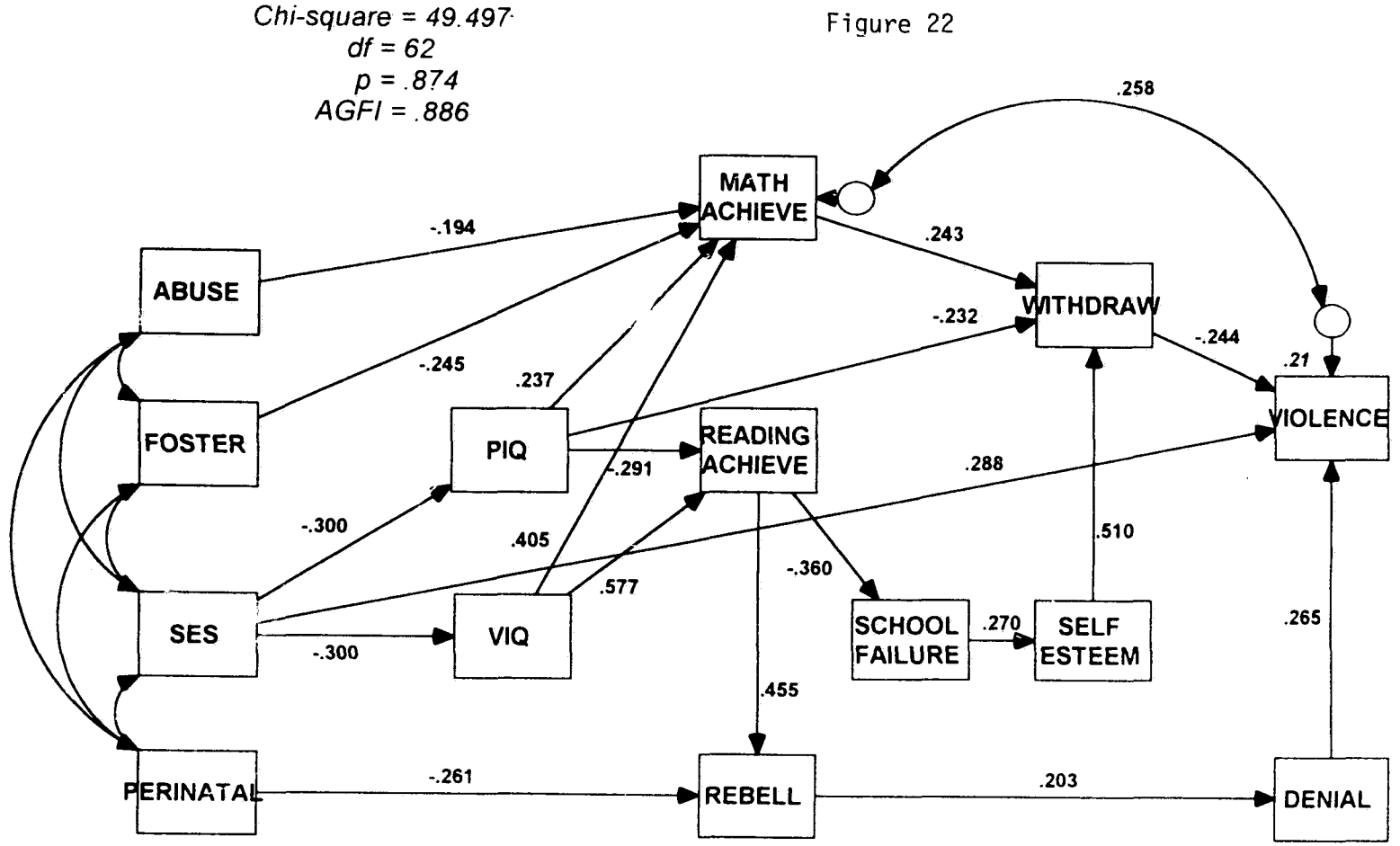


MODIFIED DENNO'S MODEL APPLIED TO THE MALE GROUP. NONSIGNIFICANT PATHS HAVE BEEN OMITTED.

family, intellectual, and school achievement variables as a starting point, the next steps evaluated the contribution of personality dimensions (egocentrism, denial, low self esteem, rebellious, and withdrawn) to the explanation of violence. First, personality dimensions were included as mediators of the effects of biological and family variables on violence, and this model was compared to a model that constrained these mediating effects to zero. Although the effects of personality dimensions could themselves be mediated by school achievement and vice versa, in the absence of theory this first model comparison seemed a reasonable place to start. Then, modification indices could be used post hoc to help generate a possible model that does consider more complex interrelations among all potential causes of violence.

For females the addition of personality dimensions as simple mediators of the effects of biology and family adversity on violence did not significantly improve the fit of the model that ignored personality ($\chi^2_{diff}(30) = 27.455$, $p = .590$). This does not mean that personality dimensions are necessarily unimportant to an explanation of violence. Rather, both models fit badly, indicating that if personality dimensions have a place as causes of violence they do not simply mediate the effect of biological variables and family adversity. The model suggested by the modification indices is shown in Figure 22 ($\chi^2(62) = 49.50$,

Figure 22



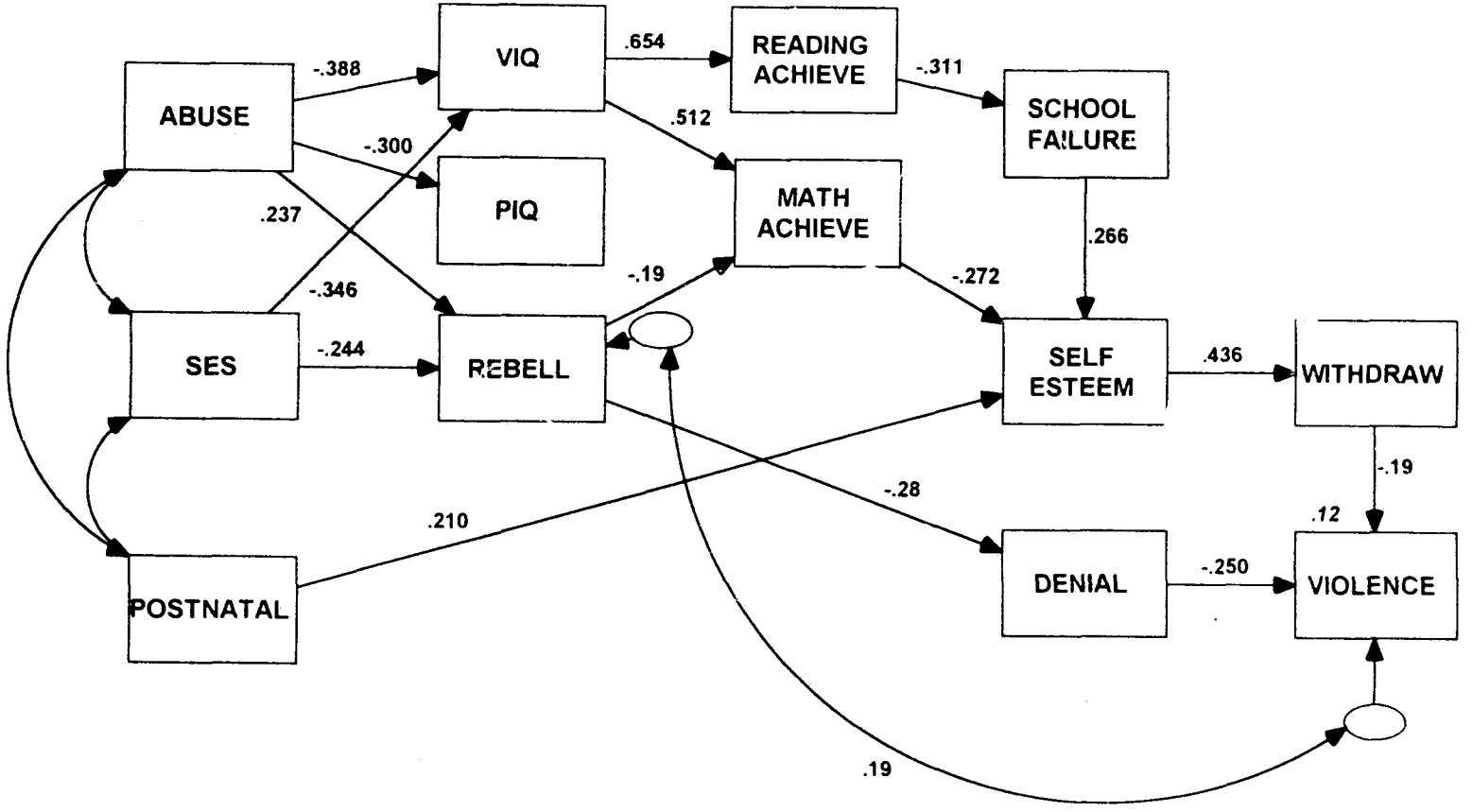
FINAL MODEL OF VIOLENCE IN FEMALE ADOLESCENT OFFENDERS

p = .874, AGFI = .89, R^2 for violence = .21). According to this model SES relates to violence both directly and indirectly through IQ, school achievement and personality dimensions. Abuse and placement in a foster home do not directly affect violence but do relate to it through math achievement and withdrawal. Although postnatal problems do not enter the model, perinatal problems do indirectly relate to violence though the personality dimensions of rebelliousness and denial. Among the personality dimensions, self esteem and withdrawal are both tied directly to indices of school achievement. Self esteem in turn relates to withdrawal and through it to violence. Finally, egocentrism drops out of the model entirely.

Math achievement appears to be a particularly sensitive but puzzling variable. As would be expected it is related to intelligence, but less clear is the fact that it is the only cognitive or achievement variable that is affected by family adversity variables. Moreover, as the curved path between their error terms suggests, there is a curious positive relationship between some of the unmeasured causes of math achievement and the unmeasured causes of violence. Clearly, math achievement would not be considered a cause of violence in the strong sense that if you could manipulate it the likelihood of violent crime would change. Rather, as the link to violence through withdrawal suggests, females who are good in math tend to be more timid, nervous and

Figure 23

Chi-square = 41.308
df = 55
p = .914
AGFI .904



FINAL MODEL OF VIOLENCE FOR MALE ADOLESCENT OFFENDERS

anxious, and those qualities may keep them from the more direct physical confrontational qualities of violence. In the end it appears as if female offenders who are not withdrawn and who are high on denial (i.e., present an overly favorable image), are more likely to commit violent crimes.

Applying the same analyses to the males showed that the addition of personality dimensions as mediators did not improve the fit of the model ($\chi^2_{diff}(29) = 30.69$, $p = .38$), and again the reason was that both models fit badly. Adjusting the model according to the modification indices produce the model shown in Figure 23 ($\chi^2(55) = 41.31$, $p = .91$, AGFI = .90, R^2 for violence = .12). SES and particularly abuse appear to have a major impact in this model, relating directly to intelligence and rebelliousness and culminating in poor school achievement, low self esteem and high withdrawal. Interestingly, postnatal problems and not perinatal problems have an impact on the males (the opposite of the girls). It appears that being sickly during childhood affects the self esteem of the males. Even more than was the case for the girls, in the final analysis it is the more well adjusted males (less withdrawn and less denying) who are more likely to commit violent crimes. In fact, this model corroborates the previously reported results that suggest male violent offenders are brighter, do better in school, and are better adjusted than male

nonviolent offenders. The model does provide one clue to this conundrum in that there is a positive relationship between rebelliousness and violence independent of the mediated relationship through denial. Apparently something or some things not measured in this study act as causes of both variables.

In sum, these models suggest a potentially disturbing scenario among adolescent offenders, particularly male offenders. The scenario suggests that in this population violence may have taken on a positive cachet such that the most capable members of the population are taking the initiative in what is viewed as a high status enterprise. However, it should be noted that none of the models account for a large amount of the variance in violence, suggesting that although there are some differences between violent and nonviolent offenders, these differences are not substantial.

CHAPTER IV

DISCUSSION

The purpose of the present study was to determine the nature and extent of gender differences in violent versus nonviolent young offenders. To this end, male and female violent and nonviolent young offenders were compared on a relatively wide range of variables including biological, family adversity, intellectual functioning, personality, substance abuse, and academic achievement. The results for each of these variable sets will be discussed separately, then summarized with respect to the hypotheses outlined in the introduction. The findings from exploratory causal modelling will then be discussed with particular emphasis on the relationship of these results to current theories of violent behavior and delinquency. The discussion will conclude by addressing treatment implications and limitations of the current study. Suggestions for future research will also be proposed.

Biological Variables. No significant effects were found for the gender, violence, or gender by violence interaction for the biological variables, both before and after partialling family adversity variables. This result contrasts with that reported by Denno (1990), where biological factors were more highly related to delinquency in general for females versus males. A stronger relationship between perinatal factors

(e.g., forceps extraction, weak labour, labour duration more than 72 hours) and violent offenses versus nonviolent offenses has also been reported by several researchers (Brennan, Mednick, & Kandel, 1991; Mungas, 1983).

A possible explanation for the lack of significant findings in the present study is the relative crudeness of the coding scheme for biological variables compared to that used for Denno's research. Clearly, biological variables for the present study were less sophisticated and fewer in number than in Denno's study, due to the relatively limited information available in the current files. This likely reduced any effects that may have been present in this sample.

Family Adversity Variables. Significantly more females than males, from both violent and nonviolent groups, had one or more foster or group home placements. This result corroborated previous research findings indicating that female delinquents were more likely to be placed in foster homes than male delinquents (Lewis et al., 1982). Rosenbaum (1993) reported that 67 percent of the females in her sample had been placed in foster or group homes (she did not include a comparison group of males), which is very similar to the percentage found in the present sample (70 %).

Significantly more females (63.7%) than males (44.8) also witnessed family violence, with similar percentages to those reported by Lewis et al. (1982) in their sample of

adolescent offenders (63.6% and 54.2% respectively).

Research on the relationship between witnessing domestic violence and psychological/behavioral problems in males versus females is divided in terms of which gender will be more adversely affected. For example, some studies have reported that exposure to family violence is associated with significantly more externalizing (e.g., conduct problems, disruptiveness, aggression, and attention-seeking; Achenbach & Edelbrock, 1984) behavioral symptoms (Jaffe et al., 1986) and behavior disorders (Ulbrich and Huber, 1981) in males versus females. Sternberg et al. (1993) expected to find greater adjustment problems such as depression, externalizing, and internalizing (e.g., timidity, shyness, avoidance, inhibition, and oversensitivity; Rubin and Mills, 1988) symptoms in males versus females as a result of witnessing domestic violence. They based this hypothesis on the research of Zaslow and Hayes (1986; cited in Sternberg et al., 1993), stating that "boys are more vulnerable to all types of stressful life events" (p. 45). However, their prediction was not supported in their sample of 61 boys and 49 girls.

In contrast to predictions that males should be more adversely affected than females by family violence, earlier researchers (Gold, 1970; Morris, 1964) suggested that female delinquency is more likely to reflect problems at home than male delinquency. More recently, Rosenbaum (1989)

investigated the family backgrounds of 240 women who had been arrested as juveniles for relatively minor offenses (e.g., truancy, running away) and concluded that "statistical analysis of the various family dysfunction measures and arrest data was relatively useless because of the overwhelming concordance of the dysfunctions and subsequent delinquent behavior" (p. 40; note that she did not use a male comparison group).

The same was true for the present sample, where a very high proportion of females were physically abused (67%), witnessed family violence (64%), came from a broken home (72%), and had one or more parental figures with substance abuse problems (78%). Rosenbaum further reported that she was unable to find a relationship between family dysfunction and severity of crime in adulthood as all the women had come from very dysfunctional homes.

To summarize, females were found, on average, to come from more adverse family environments than males, indicating (albeit retrospectively) that an adverse family background affects them more in terms of acting out in illegal ways. This finding is at least partially supported by previous research and consistent with Denno's (1990) proposal that females must experience more adverse family environments relative to males before committing delinquent acts.

As predicted, violent offenders had a significantly more adverse family environment than nonviolent offenders,

independent of gender. The family adversity variables that were found to be significantly higher for violent offenders in the present study are clearly supported by previous research in this area, and included physical abuse (e.g., Lewis et al., 1979; Walsh et al., 1987), witness to family violence (e.g., Lewis et al., 1979; Sendi & Blemgren, 1975, cited in Shamsie, 1985), and lower SES background and parental educational level (e.g., Straus, 1991). Using similar family adversity variables, Cornell (1990) found that violent offenders (males and females were combined for analyses) showed a trend (nonsignificant) to score higher on measures of family dysfunction than nonviolent offenders.

Wechsler Intelligence Scores. Juvenile delinquents typically score approximately eight points lower in psychometric intelligence scores compared to the Wechsler normative sample (Moffitt & Silva, 1988). The mean Full Scale IQ (FIQ) for the entire sample in the present study was 97.4, which is only 2.6 IQ points lower than the normative population mean of 100. However, this may not be surprising given that the children residing in Canada have been found to score five FIQ points higher, on average, than the Wechsler normative sample based on the U.S. population (Strauss, personal communication, 1994). Taking the higher norms for the Canadian population into consideration, the current sample scored about eight IQ points lower than the normative sample appropriate for the geographical location

of subjects, which is consistent with previous research findings.

Analyses of Wechsler IQ scores partially supported the hypotheses outlined in the present study. There were no significant gender or violence level differences, although there was a nonsignificant trend for males (mean FIQ = 99.5) to score higher than females (mean FIQ = 95.2). Unfortunately, Denno (1990) did not directly compare males and females on IQ scores. Moffit and Silva (1988), likewise did not report summary statistics for IQ scores by gender in their sample of male and female offenders. Therefore, it is not possible to determine how the results for the current sample compare to those of the above studies.

Violent offenders did not score significantly lower on FIQ scores than nonviolent offenders. However, other studies have reported similarly unexpected findings (Lewis et al., 1979; Nestor, 1992) in comparing IQ scores in samples of violent versus nonviolent offenders. Nestor (1992) found mean intelligence levels within the Average range (FIQ = 90 to 110) within his sample of young adult males charged with murder and other forms of extreme violence. Balthazar and Cook (1984) also reported nonsignificant IQ differences in a sample of violent and nonviolent female delinquents.

There was a significant interaction such that violent males (mean = 101.8) showed a higher FIQ than violent

females (mean = 94.1), whereas no sex difference was found among nonviolent offenders. A similar comparison has not been undertaken in previous research.

Denno (1990) suggested that "intelligence is not a significant predictor of delinquency when controlling for important intervening factors, such as SES" (p. 48). Similarly, Walsh et al. (1987) found that family adversity variables comparable to those used in the present research, were more strongly associated with violence than intellectual variables (WISC-R scores). In the present study, when the effects of family adversity variables, which are related to gender and violence, were removed, the interaction effect disappeared. This finding underscores the importance of a multifactorial approach in studies of violence and delinquency.

A higher Performance IQ score relative to the Verbal IQ score (PIQ > VIQ) is also widely reported for delinquent versus nondelinquent populations (e.g., Cornell & Wilson, 1992; also see Quay, 1987, for a review of this research). A significant difference between VIQ and PIQ was found for the present total sample (mean VIQ = 94.5; mean PIQ = 100.9), and corroborates previous research findings. Significant PIQ > VIQ differences were not found between violent and nonviolent offenders, which has also been reported previously (Cornell & Wilson, 1992; Tarter et al., 1985).

The significant interaction reported above for FIQ, held for the average PIQ/VIQ scores. In other words, there was no significant difference between nonviolent males and females, but violent females showed a significantly lower average VIQ/PIQ score than violent males. Again, this effect became nonsignificant when family adversity, biological, and personality variables were statistically controlled.

Interestingly, when the effects of the above variables were removed, a trend emerged that approached significance ($p = .06$) for violence. Specifically, violent offenders scored higher on the average of their VIQ and PIQ scores (mean = 100) than nonviolent offenders (mean = 96.2). A similar result was found for FIQ. Although, as mentioned above, several studies have failed to find that nonviolent offenders are significantly more intelligent than violent offenders, no studies have reported the trend found in the present sample. Because this effect emerged after controlling for several other variable sets, it is difficult to clarify the complex interrelationships among the various groups of variables at this point. However, this unexpected finding will be elaborated in the section that discusses the results of causal modelling.

Analyses of individual Wechsler subtests revealed that males scored higher than females on Information and Block Design, whereas females scored higher on Coding, when the

effects of the other variables were controlled. Gender differences on specific subtests for violent versus nonviolent offenders has not been addressed in previous research. However, it is perhaps not surprising that females score lower than males on the Information subtest. This test is sensitive to degree of verbal and cognitive stimulation promoted within the home, which may not be as available to the females given their relatively more adverse family environments.

Overall, however, subtest analyses were not particularly enlightening, and support Quay's (1987) conclusion regarding the relatively minimal insight that research incorporating subtest analysis has been able to provide to date.

Personality Variables.

MMPI

As stated in the introduction, the personality instrument most often used in research with offender samples is the MMPI. This section will first focus on MMPI results, followed by a review of MAPI findings.

The mean two-point code for the total sample was 4-8 (Psychopathic Deviate and Schizophrenia; mean T scores = 68 and 62 respectively). This two-point code is widely reported for the offender population in general (e.g., Armentrout & Hauer, 1978), but is not particularly illuminating in that two-point codes have not been found to

consistently discriminate violent from nonviolent offenders (Fraboni, et al., 1990; Megargee, 1976).

As previously mentioned, profile analysis was used to analyze MMPI profiles. This procedure improves on two-point code analysis in that it permits inspection of two-point codes for each group of interest, and in addition provides an analysis for each group separately for the entire set of 13 MMPI scales.

The significant three-way interaction (sex by violence by MMPI profile) suggested a fairly complex picture in which sex differences in personality profiles depended in turn on level of violence. Nevertheless, the findings generally corroborate several studies that have reported that female delinquents show more personality deviance than male delinquents (for a review of these see Cowie et al., 1968).

In particular, nonviolent females scored higher than nonviolent males on the following MMPI scales: Hypochondriasis, Depression, Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, Hypomania, and Frequency. Violent females scored higher than violent males on the Psychopathic Deviate and Frequency scales (tendency to endorse unusual attributes).

All of the above MMPI scales, with the exceptions of Psychopathic Deviate, Hypomania, and Frequency scales, could be considered as reflecting internalizing symptoms relating to depression and anxiety. Recall that significantly more

females than males witnessed family violence, which may relate to the greater level of internalizing symptoms for the females. Jaffe et al. (1986) found that females from violent families were more likely to show internalizing symptoms than males from violent families. Sternberg et al. (1993) reported more depressive symptoms in females versus males from violent families. Thus, the results from these two studies partially support the finding that females scored higher than males on those MMPI scales reflecting internalizing symptoms.

Although not significantly different from each other, a high proportion of each sex had a history of physical abuse (males: mean = 62%; females mean = 67%). Research on the behavioral symptoms of physical abuse indicates that given equivalent histories of physical abuse, females are more likely to show internalizing and externalizing symptoms than males (Sternberg et al., 1993). This finding is supported by the present results, in that the females in this sample also showed higher scores on those MMPI scales that reflect externalizing behaviors (Psychopathic Deviate and Hypomania).

The 13 MMPI scales were reduced to three factors, in an attempt to identify relatively parsimonious personality test patterns. These factors were labelled Egocentric (reflecting demanding, egocentric, hostile, antisocial, and suspicious characteristics), Denial (attempt to present an

overly favourable self-image), and Low Self-Esteem (shyness, anxious and withdrawn in social situations). The Egocentric and Low Self-Esteem factors are consistent with subtypes of violent offenders reported in the literature. For example, Toch (1969) identified two broad categories of violent-prone offenders: those who use violence in an egocentric fashion to exploit others (which corresponds to the Egocentric factor) and those who engage in violent acts in order to promote or defend a vulnerable self-image (equivalent to the Low-Self Esteem factor).

Blackburn (1986) derived two factors from the ten scales on the Special Hospitals Assessment of Personality and Socialization, which were the Antisocial Aggression (corresponds to the Egocentric factor) and the Social Withdrawal (corresponds to the Low Self-Esteem factor) factors.

In the present study, nonviolent females scored higher than the nonviolent males on the Egocentric factor and lower than the males on the Denial factor, suggesting that females are more likely to be domineering, hostile, moody, and have difficulty trusting others. They are also more likely to freely admit to psychological difficulties, at least in the test-taking situation. That the females showed more difficulty trusting others and more suspicious characteristics than males is partially supported by Panton's (1975) study comparing adult male and females

offenders. In this study, it was reported that females were more likely to show higher scores on the MMPI Paranoia scale.

MAPI

The MAPI has not been used to date in research on various adolescent offender groups. Females scored significantly higher than males on MAPI scales Sensitive, Personal Esteem, Sexual Acceptance, Family Rapport, and Attendance Consistency, indicating that the females have lower self esteem and are more frequently truant than males. That the females score higher on the Family Rapport scale (indicating tension and conflict within the family setting) lends support to the construct validity of the family adversity variables, given that females scored significantly higher on these as well.

The nonviolent offenders surprisingly scored higher on the average of all 20 MAPI scales than the violent offenders, primarily on those scales reflecting low self-esteem, indicating that, as a group, the violent offenders are more well-adjusted than the nonviolent offenders. However, this finding is not unprecedented in the literature, where Quay (1964) found a negative relationship between assaultiveness and emotional disturbance in a sample of institutionalized adolescent male offenders. Using a sample of incarcerated women, Sutker et al. (1978) reported that violent offenders showed significantly less deviant

personality profiles (MMPI) than nonviolent offenders.

Principal components analysis of the 20 MAPI scales produced two factors: the Rebellious (domineering, reaction against societal rules and regulations, impulsive tendencies) and Withdrawal (social awkwardness, poor self-concept, peer rejection) factors. Females showed a tendency (nonsignificant) to score higher than the males on both factors. Additionally, nonviolent offenders scored significantly higher than violent offenders on the average of the MAPI factor scores, again suggesting that they are less well adjusted than the violent offenders.

Achievement Test Variables. Males scored higher than females on the WRAT-R Arithmetic ("math") and Reading subtests, whereas the females scored higher than the males on the Spelling subtest. An identical pattern of gender differences was reported by Brickman et al. (1984) in their sample of violent and nonviolent adolescents. There were no significant differences between violent and nonviolent offenders on the WRAT-R scores. This finding was also reported by Brickman et al. (1984). However, Denno (1990) found that violent offenders scored lower on achievement tests than nonviolent offenders.

The total sample scored significantly lower than the normative population on the Reading and Arithmetic WRAT-R subtests, and lower than would be expected given the overall average range of intellectual functioning, indicating

academic underachievement, particularly in math. The finding that samples of young offenders or delinquents score lower on achievement measures than the general population has been widely reported in the literature (see Quay, 1987, for a review).

Substance Abuse. Females, independent of offense type, were significantly more likely than males to show indicators of substance abuse. This result is consistent with that found by Kandel (1979), in a large sample (N = 1879) of New York State high school students, where females were significantly more likely than males to report use of hard liquor and marijuana.

Summary and Comparison of Results to Hypotheses. As outlined in the introduction, review of previous research on violent young offenders led to the following hypotheses: 1. females would show more deviant scores on all variable sets than males; 2. violent offenders would show a more deviant pattern of results than nonviolent offenders; 3. an interaction effect between gender and violence such that sex differences would be more pronounced for violent versus nonviolent offenders.

Of these three hypothesis, the first received the most support, with females coming from more adverse family environments, scoring lower on intelligence and achievement tests, and producing more deviant personality profiles than males.

The second hypothesis was only partially supported in that violent offenders scored higher on the family adversity variables than the nonviolent offenders. However, counter to prediction, violent offenders showed higher psychometric intelligence scores, and were more well adjusted on personality measures than nonviolent offenders.

Minimal support was found for the third hypothesis as well. There was a greater sex difference in the violent group than the nonviolent group on intelligence scores and on the MMPI Psychopathic Deviate and Frequency scales. However, in general the greatest sex difference on the MMPI was found for the nonviolent group, although the effect was in the expected direction, with females scoring higher on the Hypochondriasis, Depression, Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, Hypomania, and Frequency scales.

Causal Modelling of Violence in Males and Females. As discussed in detail in the results section, Denno's (1990) model provided a poor fit to the current data. The following discussion will focus on the final models derived for males and females separately. These models were exploratory rather than confirmatory, as there are no theories that connect all of the constructs used in the current study.

For females, SES appeared to be the most powerful predictor of violence. SES was related both directly and

indirectly through intelligence, school achievement, and personality dimensions. The direct path suggests that independent of all other variables in the model, lower SES was related to an increased likelihood of violent crime. In contrast, the indirect path suggests that when the effects of lower SES are manifest in lower intelligence and verbal academic achievement, lower self esteem and increased withdrawal result, and lead to a decreased likelihood of violent crime.

The deleterious effect of SES on math achievement is magnified by an abusive family environment and foster home placement. However, unlike verbal achievement, math achievement does not impact on school failure and self esteem. Rather, poor math achievement leads directly to less withdrawal and through it to increased violence. As previously mentioned, it is unlikely that math achievement is itself a causal factor of violence. Why math achievement is a particularly sensitive index of family adversity, and why females who are relatively high math achievers are more withdrawn is unclear. Perhaps females who show relatively high math ability are also more socially awkward and experience more peer rejection, which results in a lower probability of direct physical confrontation with peers. The correlation between the error terms connecting math achievement and violence suggests that the "true" explanation may lie in variables not measured in this study.

A third path leading to violent versus nonviolent offenses commences with perinatal events (in this case, premature birth), then combines with higher reading achievement to produce rebelliousness. A possible explanation for this is that females who are not born prematurely are more likely to possess physical attributes, such as better physical health, that, along with higher verbal skills, promote a more aggressive, dominant, and strong-willed self-image. Rebelliousness in turn leads to violent offenses through t` MMPI Denial factor, indicating that females who present themselves in an overly positive light are more likely to commit violent offenses.

To summarize, the model for females that included personality variables suggested that those with lower SES and relatively poor achievement in reading are more likely to fail one or more grades in school, have lower self-esteem, be more withdrawn ("internalizing"), and less likely to commit violent crimes. Conversely, those with relatively low math achievement but high reading achievement are less withdrawn, more rebellious ("externalizing"), more denying, and more likely to commit violent crimes.

The final model for the males indicates that higher levels of abuse and lower SES negatively affect verbal intelligence, which in turn is related to lower math and reading achievement levels. Lower reading achievement is directly related to school failure, and subsequently lower

self esteem, which was also the case for females. However, lower math achievement was also related to lower self-esteem for males, whereas this relationship was not observed for the females. Nevertheless, like the female offenders, lower self-esteem leads to social withdrawal and awkwardness, which in turn reduced the probability of committing a violent versus a nonviolent crime.

The second path for the males again begins with abuse and SES, but in this case abuse combines with higher SES to promote rebelliousness, less denial, and eventually more violent behavior. This pattern agrees with the configuration for females in showing that rebelliousness eventually leads to violence, although for males it does so through less denial rather than more.

That abuse combines with higher SES to eventually increase the likelihood of violence, whereas abuse combined with low SES decreases the likelihood of violence, is on the surface, an unexpected finding. However, Trickett et al. (1991) found that "for abused children but not comparison children, higher SES was associated with more behavior problems." (p. 156). They proposed that a possible explanation for this phenomenon was that it is difficult to separate the effects of low SES and abuse, particularly at the lower end of the SES spectrum.

An alternative explanation may be that for adolescents from lower SES backgrounds, physical punishment is not

perceived as abusive, and may be viewed as more normal within that particular segment of society. This suggestion would be consistent with previous research findings that parents with lower SES are more likely to use authoritarian discipline, physical punishment, and be controlling of their child's behavior. Within middle-class populations, parents are more likely to use verbal reasoning, promote autonomy, show egalitarian parenting styles, and express positive affect toward their children (Patterson et al., 1989). Therefore, adolescents from higher SES backgrounds may be more adversely affected by physical punishment because such treatment is perceived as more abnormal within that social milieu. Therefore, the child may feel that he must have done something especially horrendous to warrant such action.

The third path originates in postnatal difficulties, which combine with poor achievement to diminish self esteem, increase withdrawal, and decrease the likelihood of violence.

Thus, for both the male and female models, there appear to be two types of adolescent offenders, a more socially withdrawn (internalizing) nonviolent type, and a more rebellious (externalizing) violent type. This finding is consistent with previous studies that have suggested that social withdrawal and aggression represent two important dimensions of childhood and adolescent behavior disturbance (Serbin et al., 1991).

Similarly, both male and female violent offenders showed higher self esteem. This result can partially be explained by the research findings of Slaby & Guerra (1988). They investigated social problem-solving skills and beliefs supporting aggression in aggressive and nonaggressive males and females. They found that aggressive males and females were significantly more likely than nonaggressive males and females to believe that aggressive behavior enhances self esteem and increases status among peers.

In summary, the models of violence for both males and females suggest processes underlying adolescent delinquency which, although they differ in some important ways, agree at a more general conceptual level. That is, for both males and females, an adverse family environment can initiate intellectual and school achievement problems. This in turn lowers self esteem and promotes a more internalizing, withdrawn personality style, which makes it less likely that they will react or strike out violently.

In contrast, when family adversity is mixed with more typically positive forces (e.g., higher abuse combined with higher SES among males), or its effects are somehow lessened relative to this population (e.g., relatively high reading achievement for girls), the result is a more externalizing, rebellious personality style that is more prone to violence. The implications of these ideas for theories of violence and delinquency are considered in the next section.

Theoretical Implications. To date literally hundreds of studies have been undertaken to explain various characteristics of violent offenders. Violence continues to grow as a social problem, and researchers within the social sciences are under increasing pressure to refine the prediction and treatment of violent behavior.

Research on violence typically compares groups of violent individuals with nonviolent individuals. Less often violent subjects are compared to control groups, which typically include individuals referred to mental health clinics who have not engaged in criminal activity, students, or randomly drawn samples from the general population (the latter group was by far the rarest within the studies reviewed for the present research).

After reviewing attempts to classify subgroups of young offenders, Rutter and Giller (1984) concluded that there is a reasonable basis for categorizing delinquents who commit violent crimes versus those who commit nonviolent crimes (e.g., stealing). Weisz et al. (1991) also found that offenders committing violent versus property crimes can be reliably differentiated on the basis of a variety of psychological variables (e.g., IQ, behavioral history, psychiatric diagnosis). In summary, a violent versus nonviolent classification system represents an improvement over earlier research that focused on comparisons of delinquent versus nondelinquent behavior.

However, others have questioned the appropriateness of dividing offender populations into violent versus nonviolent (or "property offenders") for the purposes of describing various characteristics unique to violent offenders (Cornell, 1990; Lochman, 1984; Mungas, 1983). The general consensus is that violent offenders make up a very heterogeneous group, and that relatively few psychological attributes consistently discriminate violent from nonviolent offenders.

Although the present study did compare the arguably heterogeneous groups of violent and nonviolent offenders, gender was included as a further subclassification of subjects, which represented an improvement over many studies that combine male and female offenders prior to dividing subjects into violent and nonviolent groups.

Of the various theories that have been proposed to explain violence, a group of related theories that are psychosocially-based seem particularly relevant with respect to the current findings. These include subculture (Wolfgang & Ferracuti, 1982), social learning (Bandura, 1959), social control (Hirschi, 1969; cited in Patterson et al., 1989), and satellization (Berzonsky, 1978) theories.

Subculture and social learning theories specifically address violent behavior, whereas social control and satellization theories propose reasons for delinquency in general. Therefore, the former two theories relate more

directly to explanations of violent behavior as a subclassification of delinquency.

Social learning theory suggests that adolescents from violent and abusive families model and imitate violent behavior, which is subsequently maintained through reinforcement and reward. Subculture theory asserts that, not only do violent families bring up violent children, but violence in sanctioned via attitudes, values, and beliefs within "pockets" of society, which are typically socially disadvantaged individuals of lower SES backgrounds.

Satellization theory goes one step further than subculture theory and states that children from conflictual, punitive, and rejecting families, will attempt to obtain prestige elsewhere. Consequently, youths from such families will be receptive to delinquent influences and will engage in activities that will raise their status within a delinquent peer group. Control theory views lack of supervision and harsh discipline as evidence of disrupted parent-child bonding, which leads to a failure to identify with parental and societal values and regulations.

This group of theories has been criticized on the grounds that they were derived from research on male populations, and as such may be relevant only for male offenders. Yet sex role theory argues that male and female offenders should in fact be becoming more similar because of a progressive equalization of opportunities for the sexes in

contemporary society.

However, Denno (1990) suggested that females and males are still socialized differently enough that violence continues to be viewed as more deviant behavior for females. Therefore, the forces (e.g., family adversity, biological factors) acting upon females to initiate delinquent activity and particularly violence should be greater than for males. The discussion to follow addresses the applicability of psychosocial theories and sex role theory to the females within the present sample.

Psychosocial theories appear to be consistent with the findings for both sexes, although particularly for the females. Violent offenses for girls in the present study were clearly related to lower SES, which would be predicted by the subculture theory of violence, where violence is viewed as being more acceptable within this segment of the population. A higher proportion of violent females were physically abused and came from a violent family environment. Social learning theory would support this finding, suggesting that they have modeled and imitated violent behavior, and learned that physical aggression is an acceptable and desirable method of problem-solving in interpersonal interactions.

Social control theory is consistent with the findings related to abusive family environments and foster home placements (indicating poor attachments to parents and

school). These exerted their influence indirectly through the relationship between lower academic achievement in math, and less social withdrawal, which combined to increase the likelihood of violent behavior. Finally, satellization theory was only indirectly supported in the present research in that, although violent females tended to come from more dysfunctional families, identification and acceptance by a delinquent peer group was only indirectly implied through less withdrawal, and more rebellious tendencies (reflecting disregard for societal regulations, concern for how they are perceived by others, and more socially outgoing characteristics).

Thus, although psychosocial theories were derived from male samples, they appeared to be applicable to female offenders in general, and violent female offenders in particular within the present sample. This argument is supported by previous research that has sought to determine whether "specialized" theories for female offenders are warranted. Figueira-McDonough (1985) and Simons et al. (1980) separately concluded that the various theories of delinquency are as applicable to females as to males. This conclusion was based on the measurement of sociocultural variables based on self-report forms assessing educational and occupational opportunity, parental rejection, alienation from norms, values of friends, and parent and teacher labelling (Simons et al., 1980) and SES background, family

and school attachments, subcultural norms, school performance, self-concept, and subcultural deviance (Figueira-McDonough, 1985).

Gender-specific theories of female versus male delinquency tend to focus on family situation and psychological profiles. Research in this area tends to find that female offenders are more likely to come from more adverse family environments and show more deviant personality characteristics than males, which was indeed supported by the present research findings. Unfortunately, Simons et al. and Figueira-McDonough did not measure personality characteristics or family variables such as abuse and foster home placements, before concluding that males and females do not require separate theories of delinquency.

Results from the current study suggest that a combination of gender specific and gender-integrated theories may better capture delinquent behavior of youth in general. It appears that females must experience a more adverse family environment before becoming involved in delinquent activities, but once they are entrenched within a delinquent subculture, similar forces as for males are related to violent behavior. This finding is consistent with both sex role theory, which expects similar forces to act upon the sexes to produce violent behavior, and Denno's argument that females must experience greater adversity than

males before engaging in delinquent activities.

A criticism that has been levelled at psychosocial learning theories pertains to the fact that not all children from abusive family environments become violent. These theories often downplay the effects of mediating cognitive or emotional processes (Emery, 1989). Indeed, in the present research, intellectual ability, academic achievement, and personality variables were important mediators of whether an aversive environment resulted in female offenders becoming either withdrawn and less violent, or rebellious and more violent. That is, when family adversity combined with or initiated additional "hardships" (e.g., lower IQ, poor academic achievement, school failure), the result was low self esteem and withdrawal (internalizing symptoms), and a reduced likelihood of acting out in a violent manner. Conversely, if the effects of an adverse family environment somehow do not stimulate a descending spiral of intellectual deficits and poor verbal school achievement then the result is rebelliousness (externalizing symptoms) rather than withdrawal, and denial of psychological difficulties, which in turn increases the probability of violent behavior.

These results seem to suggest that the cumulative effect of negative events lead to less rather than more violent behavior through a more withdrawn, internalizing personality style. Family adversity leads to violence only

for more intelligent females who are able to achieve relatively well academically, leading them to become more rebellious and externalizing, and finally violently acting out. One could speculate that these individuals interpret their adverse family situation less personally and are consequently more angered by their perceived "injustices". Because they are less withdrawn, they may be more likely to direct their anger towards others rather than towards "objects" (property crimes).

A similar general pattern also held for males. That is, the accumulation of a greater number of negative events and personal characteristics lead to low self esteem, more withdrawal, and less violence. However, a combination of negative and positive family variables (in this case abuse and higher SES) resulted in more rebellious or externalizing characteristics, less denial, and a greater likelihood of violence.

Thus, it appears that psychosocial theories do not capture the complex interrelationships between the variables found in the current study. Psychosocial theories imply an additive relationship between adverse environmental events and violence in which more adversity should sum to more violence. However, the results of the current study suggest a non-linear relationship between adversity and violence in which the likelihood of violence may initially increase with adversity, but that at some point additional adversity in

the form of lower intelligence and poor achievement, leads to personal despair, withdrawal, and a decreased likelihood of violence.

Although a similar global theme seems to capture the models of violence in males and females, there are several important differences between the genders as well. Interestingly, the differences imply that traditional "male" theories of delinquency and violence apply less well to the males. Specifically, although violent males were on average lower in SES, the subset of violent males who came from higher SES backgrounds, were the most psychologically well-adjusted, intelligent, and high achieving group in the sample. Indeed, this group explains the potentially perplexing results which show that low SES is associated with low intelligence, violent males have lower SES than nonviolent males, yet violent males have on average higher intelligence than nonviolent males. Clearly, traditional psychosocial theories would be hard pressed to account for this group.

A possible explanation for this unexpected finding is that violence as an acceptable and even desirable means of interpersonal problem-solving is no longer primarily the domain of the lower SES segment of society, but is infiltrating the norms and values of youths from middle-class backgrounds as well. Thus, Wolfgang's (1978) subculture theory of violence may need to redefine the

population parameters of the violent subculture to include males from higher SES families. Apparently violence, perhaps due to its portrayal in the media, has taken on a more positive cachet and become increasingly embraced by males of all social classes. The current data may even suggest that among males, violence has attained enough positive status to attract some of the most capable adolescents.

To summarize, the present research indicates that females must experience more adverse family environments than males to become involved in delinquent activities. However, once they do become delinquent, males and females generally show a similar pattern of relationships among variables and violence. However, an important difference was found for a subset of males, suggesting that males from higher SES backgrounds, who are also more intelligent and well-adjusted, were more likely to commit violent crimes, indicating that population parameters subsumed under subculture theory may need to be more broadly defined to include the possibility that more capable males are embracing the violent subculture.

Additionally, psychosocial theories of violence and delinquency are relatively unidimensional in nature and do not capture the complex inter-relationships among several important groups of variables. As the results of the current study suggest, a multifactorial mediational approach

is clearly warranted in future research attempting to predict violent behavior in young offenders.

Treatment Implications. Given that family adversity was one of the most powerful predictors of violence, the treatment methods for individuals and families where violent behaviors are a concern will be addressed first. The degree of optimism with respect to the treatability of violent offenders and their families varies among the various researchers addressing this issue. However, there appears to be a general consensus that interventions at the family level are most successful (Kazdin, 1987, Patterson et al., 1989). Parent training programs that focus on providing methods for improving family management have shown a high degree of success (Kazdin, 1987). Patterson et al. (1989) recommend combining this approach with social-skills training and teaching strategies to enhance academic achievement for offenders may provide optimal results.

Treatment aimed at the family level has moved from traditional psychotherapy to more effective behavior therapy methods, including stress management, promoting parent-child bonding through increased and effective communication and listening skills, and increasing social support through self-help groups (Emery, 1989). Prevention efforts through the provision of educational programs to teach alternatives to violence have also shown positive outcomes (Emery, 1989), and indeed seem to warrant serious consideration as a

primary approach to reducing violence within the community.

The results of the current study indicate that therapy at the individual or group level may be a desirable alternative to family therapy, especially in light of the fact that many of these youth are placed in foster homes (although educational efforts directed to foster parents may also prove beneficial). Individuals of either gender that have been severely traumatized may best benefit from individual or a combination of individual and group therapy.

If assessment results indicate low self esteem and social withdrawal, combined with lower verbal abilities, individual therapy should include a cognitive-behavioral approach to focus on social skills training, lowering discomfort in social situations, and enhancing positive self-attributions. A combination of rebellious characteristics, abusive background, and higher intelligence, on the other hand, may indicate that anger management techniques within the context of an insight-oriented therapy may be beneficial. Both of these approaches would be greatly facilitated by a supportive therapeutic relationship where the therapist maintains a quality of "unconditional positive regard". Indeed, this quality is critical in working with adolescents who have difficulty trusting others as a result of an abusive or overly punitive family situation.

If intake assessment results indicate that group

therapy is appropriate, present results indicate that it may be desirable to have separate groups for each sex. Females are likely to come from more adverse family environments, and given the high proportion of them that have been placed in foster homes, many of them are likely to share feelings of rejection, abandonment, and low self esteem. Females at this age are also likely to present different concerns relating to sexuality as well, such as pregnancy, abuse, and premenstrual syndrome. Additionally, as a group, the females tend to have lower verbal intellectual abilities, and anger management should be taught and modeled in a behaviorally oriented, relatively concrete manner.

The same treatment recommendations outlined above for the females apply to the males with one exception. Violent males who are relatively bright and come from higher SES background may best benefit by being selected for group therapy on the basis of these characteristics. Therapy for this group may combine more insight-oriented and cognitive-behavioral approaches. Additionally, as physical abuse for this group may have been particularly damaging, feelings surrounding the abuse, and resolution of these may be a reasonable goal for therapy.

Limitations of the Current Study. Archival research is vulnerable to missing data, potential biases in record-keeping and interview techniques. Future research comparing gender differences in violent and nonviolent individuals

would do well to collect data prospectively rather than retrospectively, which would greatly reduce the amount of missing data and would promote collecting information with direct theoretical and empirical relevance.

Potentially important variables that deserve investigation include information on sexual abuse, suicide attempts, depressive and Post Traumatic Stress Disorder symptoms, age of parents, contact with biological father (or mother if youth is residing with father), qualities of relationship to primary parental figures, the effects of media, and stressful life events such as death of significant other and school/geographical changes. Additionally, it may be useful to further investigate intellectual functioning by comparing WISC-III factor scores separately for the four offender groups on the WISC-R subtests.

The presence of "protective factors" would be an additional area for investigation. For example, Rutter (1978) found that a warm and confiding relationship tends to inoculate the child against deleterious factors in the environment. Children without such a relationship were four times more likely to develop antisocial behavior. Subcultural variables such as attitudes towards aggression, identification with and acceptance by deviant peer group, and interpersonal problem-solving abilities would be another area worth investigating to elaborate and clarify the

findings in the present study.

The inclusion of a control group and longitudinal research design would be particularly useful in determining differences between violent and nonviolent youth who have not been officially charged with violent behavior. A longitudinal design would also address whether the paths leading to violence found in the present study would be consistent with observed developmental processes.

Additionally, Slaby and Guerra (1988) were able to demonstrate that social problem-solving skills and beliefs supporting aggression, as cognitive mediators of aggressive behavior, reliably differentiated aggressive from nonaggressive males and females. The inclusion of similar variables in the present study would likely have increased the predictability of violence and perhaps clarified the unexplained linkages (e.g., correlated error terms) suggested by the structural equation models.

References

Abe, M. (1969). The Japanese MMPI and its delinquency scale. Tohoku Psychologica Folia, 84, 54-68.

Achenbach, T.M. & Edelbrock, C.S. (1984). Psychopathology of childhood. Annual Review of Psychology, 35, 227-259.

Adler, F. (1975). Sisters in Crime. New York: McGraw-Hill.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (Fourth Ed.). Washington, DC: The American Psychiatric Association.

Andrew, J.M. (1976). Delinquency, sex, and family variables. Social Biology, 23, 168-174.

Arbuckle, J. (1992). AMOS 3.1: Documentation package. Unpublished manual: Temple University, Philadelphia, PA.

Arbuthnot, J., Gordon, D.A., & Jurkovic, G.J. (1987). Personality. In H.C. Quay (ed.) Handbook of Juvenile Delinquency, (p. 139-183). New York, NY: John Wiley & Sons.

Armentrout, J.A. & Hauer, A.L. (1978). MMPIs of rapists of adults, rapists of children, and nonrapist sex offenders. Journal of Clinical Psychology, 34, 330-332.

Aultman, M.G. (1980). Group involvement in delinquent acts- a study of offense types and male-female participation. Criminal Justice and Behavior, 7, 185-192.

Balthazar, M.L. & Cook, R.J. (1984). An analysis of the factors related to the rate of violent crimes committed by incarcerated female delinquents. Journal of Offender Counselling, Services, and Rehabilitation, 9, 103-118.

Bandura, A. & Walters, R.H. (1959). Adolescent aggression. New York, NY: Ronald Press.

Bartol, C.R. (1980). Criminal behavior: A psychosocial approach. Englewood Cliffs, NJ: Prentice-Hall.

Bauer, G. & Clark, J. (1976). Personality deviance and prison incarceration. Journal of Clinical Psychology, 32, 279-282.

Berzonsky, M.D. (1978). Ausubel's satellization theory: Application to some research on adolescence. Adolescence, 13, 167-180.

Blackburn, R. (1986). Patterns of personality deviation among violent offenders. British Journal of Criminology, 26, 254-269.

Brennan, P., Mednick, S., & Kandel, E. (1991). Congenital determinants of violent and property offending. In: D.J. Pepler & K.H. Rubin (eds.). The Development and Treatment of Childhood Aggression. Hillsdale NJ: L. Erlbaumb Associates.

Brickman, A.S., McManus, M., Grapentine, W.L., & Alessi, N. (1984). Journal of the American Academy of Child Psychiatry, 23, 453-457.

Briggs, P.S., Wirt, R.D., & Johnson, R. (1961). An application of prediction tables. Journal of Consulting Psychology, 25, 46-50.

Brownstone, D.Y. & Swaminath, R.S. (1989). Violent behavior and psychiatric diagnosis in female offenders. Canadian Journal of Psychiatry, 34, 190-194.

Bryant, E.T., Scott, M.L., Golden, C.J., & Tori, C.D. (1984). Neuropsychological deficits, learning disability, and violent behavior. Journal of Consulting and Clinical Psychology, 52, 323-324.

Burquest, B. (1981). The violent girl. Adolescence, 16, 749-764.

Carr, M., Borkowski, J.G., & Maxwell, S.E. (1991). Motivational components of underachievement. Developmental Psychology, 27, 108-118.

Cattell, R.B. & Cattell, A.K. (1958). IPAT Culture Free Intelligence Test. Champaign, IL: Institute of Personality and Ability Testing.

Chick, G.E. & Loy, J.W. (1984). Differentiating violent and non-violent opiate-addicted reformatory inmates with the MMPI. Journal of Clinical Psychology, 40, 619-623.

Cornell, D.G. & Wilson, L.A. (1992). The PIQ > VIQ discrepancy in violent and nonviolent delinquents. Journal of Clinical Psychology, 48 (2), 256-261.

Cowie, J., Cowie, V. & Slater, E. (1968). Delinquency in girls. London: Heinemann.

Culberton, F.M., Feral, C.H., & Gabby, S. (1989). Pattern analysis of Wechsler Intelligence Scale for Children-Revised profiles of delinquent boys. Journal of Clinical Psychology, 45, 651-660.

Denno, D.W. (1990). Biology and Violence: From Birth to Adulthood. New York: Cambridge University Press.

Emery, R.E. (1989). Family violence. American Psychologist, 44, 321-328.

Eysenck, S.B. & Eysenck, H.J. (1973). The personality of female prisoners. British Journal of Psychiatry, 122, 693-698.

Figueira-McDonough, J. (1985). Are girls different? Gender discrepancies between delinquent behavior and control. Child Welfare, 64, 273-289.

Fine, B. (1967). Underachievers: How they can be helped. New York, NY: Dutton.

Fraboni, M, Cooper, D., Reed, T.L., & Saltstone, R. (1990). Offense type and two-point code profiles: Discriminating between violent and nonviolent offenders. Journal of Clinical Psychology, 46, 774-777.

Freud, S. (1933). New introductory lectures on psychoanalysis. New York, NY: W.W. Norton.

Gearing, M.I. (1979). The MMPI as a primary differentiator and predictor of behavior in prison: A methodological critique and review of the recent literature. Psychological Bulletin, 86, 929-963.

Gelles, R.J. (1985). Family violence. Annual Review of Sociology, 11, 347-367.

Gendreau, P., Grant, B.A., Leipciger, M., & Collins, S. (1979). Norms and recidivism rates for the MMPI and selected experimental scales on a Canadian delinquent sample. Canadian Journal of Behavioral Science, 11, 21-31.

Gibson, H.B. (1969). Early delinquency in relation to broken homes. Journal of Child Psychology, 10, 195-204.

Gold, M. (1970). Delinquency in an American City. Monterey, CA: Brooks/Cole.

Gora, J.G. (1982). The New Female Criminal: Empirical Reality or Social Myth? New York, New York: Praeger Publishers.

Gregory, R.J. (1977). The actuarial description of delinquency: Seven MMPI code types. Dissertation Abstracts International, 33, 5017.

Harris, A.R. (1977). Sex and theories of deviance: Toward a functional theory of deviant type-scripts. American Sociological Review, 42, 3-16.

Harris, R.E. & Lingoes (1955). Subscales for the MMPI: An aid to profile interpretation. University of California Department of Psychiatry (mimeo).

Hathaway, S.R. & McKinley, J.C. (1967). Manual for the Minnesota Multiphasic Personality Inventory (Rev. Ed). Minneapolis, MN: University of Minnesota Press.

Hathaway, S.R. & Monachesi, E. (1963). Adolescent personality and behavior: MMPI patterns of normal, delinquent, dropout, and other outcomes. Minneapolis, MN: University of Minnesota Press.

Haynes, J.P. & Bensch, M. (1981). The P > V sign on the WISC-R and recidivism in delinquents. Journal of Consulting and Clinical Psychology, 45, 480-481.

Hays, J.R. & Solway, K.S. (1977). Violent behavior and differential Wechsler Intelligence Scale for Children characteristics. Journal of Consulting and Clinical Psychology, 45 (6), 1187.

Hays, J.R., Solway, K.S., & Schreiner, D. (1978). Intellectual characteristics of juvenile murderers versus status offenders. Psychological Reports, 43, 80-82.

Healy, W. & Bronner, A.F. (1926). Delinquents and criminals: Their making and unmaking. New York, NY: Macmillan.

Hecht, I.H. & Jurkovic, G.J. (1978). The performance-verbal IQ discrepancy in differentiated subgroups of delinquent adolescent boys. Journal of Youth and Adolescence, 7, 197-201.

Heilbrun, A.B. (1979). Psychopathy and violent crime. Journal of Consulting and Clinical Psychology, 47, 509-516.

Heilbrun, A.B., Knopf, I.J., & Bruner, P. (1976). Criminal impulsivity and violence and subsequent parole outcome. British Journal of Criminology, 16, 367-377.

Heller, M.S., Ehrlich, M., & Lester, D. (1983). Victim-offender relationships and severity of victim injury. The Journal of Social Psychology, 120, 229-234.

Henderson, M. (1986). An empirical typology of violent incidents reported by prison inmates with convictions for violence. Aggressive Behavior, 12, 21-32.

Hircshi, T. (1969). Causes of delinquency. Berkley, CA: University of California Press.

Hirschi, T. & Hindelang, M. (1977). Intelligence and delinquency: A revisionist review. American Sociological Review, 42 (4), 571-587.

Hogan, A.E. & Quay, H.C. (1984). Cognition in child and adolescent behavior disorders. In B.B. Lahey & A.E. Kazdin (Eds.), Advances in Clinical Child Psychology (p. 1-34). New York, NY: Plenum Press.

Holcomb, W.R & Anderson, W.P. (1983). Inpatient violence and the schizophrenic patient. Acta Psychiatrica Scandinavia, 67, 313-317.

Hubble, L.M. & Groff, M. (1981). Magnitude and direction of WISC-R Verbal-Performance IQ discrepancies among adjudicated male delinquents. Journal of Youth and Adolescence, 10, 179-184.

Huesmann, L.R., Lefkowitz, M.M., & Eron, L.D. (1978). Sum of MMPI scales F, 4, and 9 as a measure of aggression. Journal of Consulting and Clinical Psychology, 46, 1071-1078.

Inamdar, S.C., Darrell, E., Brown, A., & Lewis, D.O. (1986). Trends in violence among psychiatrically hospitalized adolescents: 1969 and 1979 compared. Journal of the American Academy of Child Psychiatry, 25, 704-707.

Jaffe, P., Wolfe, D., Wilson, S., & Zak, L. (1986). American Journal of Psychiatry, 143, 74-77.

Johnson, J. (1971). A cross validation of 17 experimental MMPI scales related to antisocial personality. Journal of Consulting and Clinical Psychology, 36, 564-565.

Jones, T., Beidleman, W.B., & Fowler, R.D. (1981). Differentiating violent and nonviolent prison inmates by use of selected MMPI scales. Journal of Clinical Psychology, 37, 673-677.

Kandel, D. (1978). Convergences in prospective longitudinal surveys of drug use in normal populations. In: D.B. Kandel (Ed.) Longitudinal research on drug use: Empirical findings and methodological issues (pp. 3-38). Washington, DC: Hemisphere-Wiley.

Kazdin, A.E. (1987). Treatment of antisocial behavior in children. Psychological Bulletin, 102, 187-203.

Kelley, C.M. (1972). Crime in the United States: Uniform crime reports. Washington, DC: Federal Bureau of Investigation.

Kulik, J.A., Stein, D.B., & Sarbin, T.R. (1968). Dimensions and patterns of adolescent antisocial behavior. Journal of Consulting and Clinical Psychology, 32, 375-382.

Kunce, J.T., Ryan, J.J., & Eckelman, C.C. (1976). Violent behavior and differential WAIS characteristics. Journal of Consulting and Clinical Psychology, 44, 42-45.

Lewis, D.O., Pincus, J.H., Lovely, R., Spitzer, E., & Moy, E. (1987). Biopsychosocial characteristics of matched samples of delinquents and nondelinquents. Journal of the American Academy of Child and Adolescent Psychiatry, 26 (5), 744-752.

Lewis, D.O., Shanok, S.S., & Pincus, J.H. (1982). A comparison of the neuropsychiatric status of female and male incarcerated delinquents: Some evidence of sex and race bias. Journal of the American Academy of Child Psychiatry, 21,190-196.

Lewis, D.O., Shanok, S.S., Pincus, J.H., & Glaser, G.H. (1979). Violent juvenile delinquents: Psychiatric, neurological, psychological, and abuse factors. Journal of the American Academy of Child Psychiatry, 18, 307-319.

Loberg, T. (1983). Belligerence in alcohol dependence. Scandanavian Journal of Psychology, 24, 285-292.

Lochman, J.E. (1984). Psychological characteristics and assessment of aggressive adolescents. In C.R. Keith (Ed.), The aggressive adolescent (pp. 17-62). New York, NY: The Free Press.

Lombroso, C. (1920). The Female Offender. New York, NY: Appleton.

Lothstein, L.M. & Jones, P. (1978). Discriminating violent individuals by means of various psychological tests. Journal of Personality Assessment, 42, 235-243.

Maccoby, E.E. & Jacklin, C.N. (1974). The Psychology of Sex Differences. Stanford, CA: Stanford University Press.

Marks, P., Seeman, W., & Haller, D. (1971). The actuarial use of the MMPI with adolescents and adults. Baltimore, MA: Williams and Wilkins.

Marohn, R.C. (1982). Adolescent violence: Causes and treatment. Journal of the American Academy of Child Psychiatry, 21, 354-360.

McMichael, P. (1979). 'The hen or the egg' which comes first- antisocial emotional disorders or reading ability? British Journal of Educational Psychology, 49, 226-238.

Megargee, E. (1976). The prediction of dangerous behavior. Criminal Justice and Behavior, 3, 3-21.

Millon, T., Green, C.J., & Meagher, R.B. (1982). Millon Adolescent Personality Inventory Manual. Minneapolis, MN: National Computer Systems.

Ministry of Social Services and Housing (1988). Interministry Child Abuse Handbook. Province of B.C.

Moffit, T.E., Gabrielli, W.F., & Mednick, S.A. (1981). Socio-economic status, IQ, and delinquency. Journal of Abnormal Psychology, 90 (2), 152-156.

Moffit, T.E. & Silva, P.A. (1988). Neuropsychological deficit and self-reported delinquency in an unselected birth cohort. Journal of the American Academy of Child and Adolescence Psychiatry, 27 (2), 233-240.

Monahan, J. (1992). Mental disorder and violent behavior: Perceptions and evidence. American Psychologist, 47, 511-521.

Monahan, J. (1981). Predicting Violent Behavior: An Assessment of Clinical Techniques. Beverly Hills, CA: Sage Publications.

Morris, R. (1964). Female delinquents and relational problems. Social Forces, 43, 82-89.

Mungas, D. (1983). An empirical analysis of specific syndromes of violent behavior. Journal of Nervous and Mental Disease, 171, 354-361.

Nestor, P.G. (1992). Neuropsychological and clinical correlates of murder and other forms of extreme violence in a forensic psychiatric population. The Journal of Nervous and Mental Disease, 180, 418-423.

Nettler, G. (1984). Explaining crime. New York, NY: McGraw-Hill.

Panton, J.H. (1975). Personality differences between male and female prison inmates measured by the MMPI. In: A.M. Brodsky (ed.), The Female Offender. Beverly Hills, CA: Sage Publications.

Panton, J.H. (1962). The identification of habitual criminalism with the MMPI. Journal of Clinical Psychology, 18, 133-139.

Patterson, G.R., DeBaryshe, B.D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. American Psychologist, 44, 329-335.

Persons, R. & Marks, P. (1971). The violent 4-3 MMPI personality type. Journal of Consulting and Clinical Psychology, 36, 189-196.

Petee, T.A. & Walsh, A. (1987). Violent delinquency, race, and the Wechsler Performance-Verbal discrepancy. Journal of Social Psychology, 127, 353-354.

Petrie, W.M., Lawson, E.C., & Hollander, M.H. (1982). Violence in geriatric patients. Journal of the American Medical Association, 23, 443-444.

Quay, H.C. (Ed.)(1987). Handbook of Juvenile Delinquency. New York, NY: John Wiley & Sons.

Quay, H.C. (1964). Dimensions of personality in delinquent boys as inferred from the factor analysis of case history data. Child Development, 35, 479-484.

Rasche, C.E. (1975). The female offender as an object of criminological research. In A.M. Brodsky (ed.) The Female Offender. Beverly Hills, CA: Sage Publications.

Robbins, D.M., Beck, J.C., Pries, R., Jacobs, D., & Smith, C. (1983). Learning disability and neuropsychological impairment in adjudicated, unincarcerated male delinquents. Journal of the American Academy of Child Psychiatry, 22, 40-46.

Robins, L. (1966). Deviant children grown up: A sociological and psychiatric study of sociopathic personality. Baltimore, MD: Williams & Wilkins.

Romney, D.M. & Syverson, K.L. (1984). An attempt to identify the personality dimensions of the violent offender. Social Behavior and Personality, 12 (19), 55-60.

Rosenbaum, J.L. (1989). Family dysfunction and female delinquency. Crime and Delinquency, 35, 31-44.

Rossi, Waite, Bose, & Berk (1974). The seriousness of crimes: Normative structure and individual differences. American Sociological Review, 39, 224-237.

Rubin, K.H. & Mills, R.S. (1988). The many faces of isolation. Journal of Consulting and Clinical Psychology, 56, 916-924.

Rutter, M. (1978). Family, area, and school influences in the genesis of conduct disorders. In L.A. Hersov, M. Berger, & D. Shaffer (eds.), Aggression and Anti-social Behaviour in Childhood and Adolescence (p. 95-113). Oxford, London: Peragamon Press.

Rutter, M. & Giller, H. (1984). Juvenile delinquency: Trends and perspectives. New York: John Wiley.

Ryan, J.J. & Blom, B.E. (1979). WAIS characteristics and violent behavior: Failure to generalize versus failure to replicate. Journal of Consulting and Clinical Psychology, 47 (3), 581-582.

Sattler, J.M. (1988). Assessment of children (3rd ed.). San Diego, CA: Author.

Sattler, J.M. (1982). Assessment of children's intelligence and special abilities. Boston, MA: Allyn & Bacon.

Schoenfeld, C.G. (1971). A psychoanalytic theory of juvenile delinquency. Crime and Delinquency, 17, 49-480.

Sendi, I. & Blemgren, P. (1975). A comparative study of predictive criteria in the predisposition of homicidal adolescents. American Journal of Psychiatry, 132, 423-427.

Serbin, L.A., Schwartzman, A.E., Moskowitz, D.S., & Ledingham, J.E. (1991). Aggressive, withdrawn, and aggressive/withdrawn children in adolescence: Into the next generation. In: D.J. Pepler & K.H. Rubin (eds.). The Development and Treatment of Childhood Aggression. Hillsdale NJ: L. Erlbaum Associates.

Shamsie, S.J. (1985). Violence and youth. Canadian Journal of Psychiatry, 30, 498-503.

Shawver, L. & Jew, C. (1978). Predicting violent behavior from WAIS characteristics: A replication failure. Journal of Consulting and Clinical Psychology, 47, (3), 583-585.

Simon, R.J. (1975). The Contemporary Women and Crime. National Institute of Mental Health, Crime and Delinquency: Rockville, MD.

Simon, R.J. & Baxter, S. (1989). Gender and violent crime. In: N.A. Weiner & M.E. Wolfgang (Eds.) Violent crime, violent criminals (p.171-197). California: Sage Publications.

Simons, R.L., Miller, M.G., & Aigner, S.M. (1980). Contemporary theories of deviance and female delinquency: An empirical test. Journal of Research and Crime in Delinquency, 17, 42-57.

Slaby, R.G. & Guerra N.G. (1988). Cognitive mediators of aggression in adolescent offenders: 1. Assessment. Developmental Psychology, 24, 580-588.

Sorrels, J.M. (1980). What can be done about juvenile homicide? Crime and Delinquency, 26, 152-161.

Spellacy, F. (1977). Neuropsychological differences between violent and nonviolent adolescents. Journal of Clinical Psychology, 33 (4), 966-969.

Sternberg, D.J., Lamb, M.E., Greenbaum, C., Cicchetti, D, Dawud, S., Cortes, R.M., Krispin, O., & Lorey, F. (1993). Effects of domestic violence on children's behavior problems and depression. Developmental Psychology, 29, 44-52.

Strasburg, P.A. (1978). Violent delinquents: A report to the Ford Foundation from the Vera Institute of Justice. New York, NY: Monarch.

Straus, M.A. (1991). Discipline and deviance: Physical punishment of children and violence and other crime in adulthood. Social Problems, 38, 133-153.

Sutherland, E. & Cressey, D. (1978). Criminology (10th ed.). Philadelphia, PA: Lippincott.

Sutker, P.B., Allain, A.N., & Geyer, S. (1978). Female criminal violence and differential MMPI characteristics. Journal of Consulting and Clinical Psychology, 46, 1141-1143.

Swanson, J., Holzer, C., Ganju, V., & Jono, R. (1990). Violence and psychiatric disorder in the community: Evidence from the epidemiologic Catchment Area surveys. Hospital and Community Psychiatry, 41, 761-770.

Synder, J. & Patterson, G. (1987). Family interaction and delinquent behavior. In H.C. Quay (ed.) Handbook of of Juvenile Delinquency, (p.216-243). New York, NY: John Wiley & Sons.

Syverson, K.L. & Romney, D.M. (1985). A further attempt to differentiate violent from nonviolent offenders by means of a battery of psychological tests. Canadian Journal of Behavioral Science, 17, 87-92.

Tabachnick, B.G. & Fidell, L.S. (1989). Using Multivariate Statistics: Second Edition. Harper and Row Publishers, New York, NY.

Tarter, R.E., Hegedus, A.M., & Alterman, A.I. (1983). Cognitive capacities of juvenile violent, nonviolent, and sexual offenders. Journal of Nervous and Mental Disease, 171, 564-567.

Tarter, R.E., Hegedus, A.M., Winsten, N.E., & Alterman, A.I. (1985). Intellectual profiles and violent behavior in juvenile delinquents. Journal of Psychology, 119, 125-128.

The Canadian Press (1993). Youth court figures: Violence on the rise, property crimes off. Times Colonist, D10, December 22, Victoria, B.C.

Toch, H. (1969). Violent Men. New York, NY: Aldine.

Tremblay, R.E. (1991). Aggression, prosocial behavior, and gender: Three magic words but no magic wand. In: D.J. Pepler & K.H. Rubin (eds.). The Development and Treatment of Childhood Aggression. Hillsdale NJ: L. Erlbaum Associates.

Trickett, P.K., Aber, J.L., Carlson, V., & Ciccetti, D. (1991). Relationship of Socioeconomic status to the etiology and developmental sequelae of physical child abuse. Developmental Psychology, 27, 148-158.

Ulbrich, P. & Huber, J. (1981). Observing parental violence: Distribution and effects. Journal of Marriage and the Family, 46, 623-631.

Vachss, A.H. & Bakal, Y. (1979). Life-style violent juvenile: The secure treatment approach. Lexington, MA: Heath Lexington Books.

Walsh, A. & Beyer, J.A. (1986). Wechsler Performance-Verbal discrepancy and antisocial behavior. Journal of Social Psychology, 126, 419-420.

Walsh, A., Beyer, J.A., & Petee, T.A. (1987a). Love deprivation, Wechsler Performance > Verbal discrepancy, and violent behavior. Journal of Psychology, 121, 177-184.

Walsh, A., Beyer, J.A., & Petee, T.A. (1987b). Violent delinquency: An examination of psychopathic typologies. Journal of Genetic Psychology, 148, 385-392.

Wechsler, D. (1958). The measurement and appraisal of adult intelligence. Baltimore: Williams & Wilkins.

Weisz, J.R., Martin, S.L., Walter, B.R., & Fernandez, G.A. (1991). Differential prediction of young adult arrests for property and personal crimes: Findings of a cohort follow-up study of violent boys from North Carolina's Willie M program. Journal of Child Psychology and Psychiatry, 32, 783-792.

West, D.J. & Farrington, D.P. (1977). The delinquent way of life. London: Heinemann Educational.

Widom, C.S. (1978). Toward an understanding of female criminality. Progress in Experimental Personality Research, 8, 245-309.

Wilson, J. & Herrnstein, R. (1985). Crime and human nature. New York, NY: Simon & Schuster.

Wolfgang, M. (1978). An overview of research into violent behavior. Testimony before the U.S. House of Representatives Committee on Science and Technology.

Wolfgang, M. & Ferracuti (1982). The subculture of violence. Beverly Hills, CA: Sage Publications.

Yale, M. & Rutter, M. (1968). Educational aspects of childhood and maladjustment: Some epidemiological findings. British Journal of Educational Psychology, 38, 7-9.

Yesavage, J.A. (1984). Correlations of dangerous behavior of schizophrenics in a hospital. Journal of Psychiatric Research, 18, 225-231.

Yeudall, L.T. (1980). A neuropsychological perspective of persistent juvenile delinquency and criminal behavior. Annals of the New York Academy of Science, 347, 349-355.

Zaslow, M. & Hayes, C. (1986). Sex differences in children's responses to psychosocial stress: Toward a cross-cultural context analysis. In M.E. Lamb, A.L. Brown, & B. Rogoff (Eds.), Advances in developmental psychology (Vol. 4, pp. 285-338). Hillsdale, NJ: Erlbaum.

Appendix A

Summary of MAPI Scale Descriptions

Name of Scale	Interpretation of High Scores
1 Introversive	Unemotional, indifferent to others, quiet, fair-minded
2 Inhibited	Shy, socially ill-at-ease, fearful of rejection, lonely
3 Cooperative	Soft-hearted, sentimental, kind, unassertive,dependent
4 Sociable	Talkative, socially charming, dramatic, emotionally expressive
5 Confident	Confident, self-centered, self-assured, egocentric
6 Forceful	Strong-willed, tough-minded, dominant, unkind, impatient
7 Respectful	Serious-minded, efficient, rule conscious, orderly
8 Sensitive	Discontented, pessimistic, moody, unpredictable
A Self-Concept	Aimless, lost, lack of personal identity, self dissatisfaction
B Personal Esteem	Critical self appraisal, weak self-image, low energy levels
C Body Comfort	Body image dissatisfaction, unhappy with physical maturation
D Sexual Acceptance	Confusion, immaturity, guilt, shame regarding sexual identity
E Peer Security	Feels rejected and unliked by peer group, needs group approval
F Social Tolerance	Detached, indifferent to others, distant social relationships
G Family Rapport	Perceives tension and conflict in family setting
H Academic Confidence	Discontented with scholastic efforts and academic performance
SS Impulse Control	Spur of the moment decision making, emotional outbursts
TT Societal Conformity	Unwillingness to comply with societal regulations
UU Scholastic Achievement	Scholastic underachievement, achieves below expected levels
WW Attendance Consistency	Habitual school truancy, fears or rebels against school situation

(Adapted from Millon, Green, & Meagher, 1982)

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O'Connor, S.C. & Spreen, O. (1987). The relationship between parents' socioeconomic status and education level, and learning disabled childrens' long-term occupational and educational achievement. Journal of Learning Disabilities, 21, 148-153.

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Title of Dissertation: Gender Differences in Adolescent Violent Crime: A Multifactorial Approach

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