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Neuropsychological Functioning Among Violent and Nonviolent Sex Offenders

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Neuropsychological Functioning Among
Violent and Nonviolent Sex Offenders

by

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ABSTRACT

Violent sex offenders, nonviolent sex offenders, violent non-sex offenders, and nonviolent non-sex offenders were compared on neuropsychological testing and on personality testing. A neuropsychological test battery and the Minnesota Multiphasic Personality Inventory - 2 (MMPI-2) were administered to 93 and 50 male felons respectively. Subjects were drawn from a data base provided by the state Department of Corrections. Potential indicators of neuropsychological impairment were controlled during the selection process. Analyses of Variance ($\alpha=.05$) found that violent sex offenders scored significantly lower than the other three groups on two measures that are sensitive to left hemisphere impairment and one that assesses right hemisphere impairment suggesting a more diffuse, rather than a lateralized mode of functioning. Non-violent sex offenders scored higher than the other groups on four of the fifteen neuropsychological measures and higher on three additional measures than two of the other three groups. Results also indicated that violent non-sex offenders may better process information with the left hemisphere. On the MMPI-2, violent sex offenders scored higher on Scale F and nonviolent sex offenders scored lower on Scales F and 9. It would appear that information regarding neuropsychological functioning may be useful in identifying more appropriate approaches to intervention for different groups of offenders. Implications for treatment are presented.

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Introduction

Violence is a social problem that increasingly affects a large number of individuals in the United States. Approximately two-thirds of all attempted acts of violence are actually completed. According to Bureau of Justice Statistics, Americans were the victims of 15.4 million crimes in 1990. Persons age 12 and older experienced six million violent victimizations, a rate of 30 victimizations per 1000 individuals. A 1987 survey (Blum) indicated that violence in the United States has replaced communicable diseases as the primary cause of mortality in young people during the past 30 years. Homicide deaths have increased 300% to become the number two killer, after accidents, of 15- to 24-year olds. Additionally, statistically significant increases in the estimates of rape occurred in 1991, with one rape per 1,000 persons over the age of 12.

These unfortunate statistics have resulted in a penal system strained by the sheer number of inhabitants. In July, 1990, the United States Department of Justice released figures indicating that, in 1988, the average monthly payroll in the federal judicial system was \$3,680,457. Of this amount, \$1,036,628 was spent by corrections with the remainder being disbursed for police protection and the judicial process. Not included in this figure is the cost of maintaining criminals in correctional facilities. In 1990, the average cost per inmate incarcerated in state

facilities was \$15,513.

Violent behavior is a phenomenon that has been widely studied by social, behavioral, and biological scientists. In spite of the degree of attention it has been afforded, however, violence has defied easy solution in terms of adequate understanding and prediction, and in effective prevention. It has proven consistently resistant to treatment, as well.

Social and Environmental Influences

In the last decade, research on sexual assault has increasingly shifted from a clinical and criminologic orientation toward one that is epidemiologic (Finkelhor & Lewis, 1988). The shift has been paralleled by one or more social-psychological concepts. Talk of sociopaths, the criminal personality, pedophilia, sadism, and masochism is giving way to talk about rape myths, substance abuse, media exposure, and attitudes and beliefs. The social-psychological concepts being used to analyze sexual assault appear to grow out of the following assumptions:

1. Social, and peer groups (the latter often accompanied by substance abuse) and social institutions, such as the media, are influential in fostering sexual assault.
2. Sexual assault behavior, although discouraged by some social sources, receives endorsement and support from others. This support is an important factor in

explaining individual behavior.

Early Experiences

Researchers and professionals have used the phrases "cycle of violence" and "intergenerational transmission of violence" loosely to refer to assumptions or hypotheses about the consequences of abuse and neglect in relation to a number of different outcomes. Others focus on the relations between child abuse and neglect and later criminal behaviors by both juveniles and adults. Widom, (1989) reviewed all cases of physical and sexual abuse and neglect processed during the years 1967 through 1971 in a county juvenile court (situated in a metropolitan area in the Midwest). Nine-hundred-eight cases of abuse and neglect processed in adult criminal court in which the victim was 11 years of age or less were selected for inclusion in her study. A control group, matched as closely as possible on the basis of sex, age, race, and approximate family socioeconomic status during the time period under study, was chosen from among the ranks of elementary school children. Findings indicated that abused and neglected children had a higher likelihood of subsequent arrests for delinquency, adult criminality, and violent criminal behavior than the matched controls. As expected, victims of physical abuse had the highest level of arrests for violent criminal behavior. According to the author, these results provide strong support for the cycle of violence hypothesis.

Koss and Dinero (1988) surveyed 2,972 male college students regarding their use of several degrees of verbal coercion and physical force to obtain sexual intimacy with women without consent. The most severe form of sexual aggression reported by each subject was used to classify them into one of five groups: sexually nonaggressive, sexual contact, sexual coercion, attempted rape, and rape. Subjects also provided data that were grouped into three blocks of variables: early experiences, psychological characteristics, and current behavior. Results support a developmental sequence of sexual aggression in which early experiences and psychological characteristics establish preconditions for sexual violence. In turn, these preconditions are most likely to be associated with self-reported sexual aggression when linked to the presence of releasing factors in the current environment.

In 1985, Langevin, Paitich, & Russon administered the Clarke Parent Child Relations (PCR) Questionnaire to 40 rapists, 40 nonviolent sex offenders (exhibitionists-voyeurs, hereafter sexual anomaly group), 40 normal controls, and 25 non-sexual assaultive offenders. The assaulters and rapists reported the most similar pattern of parent child relations. The largest effect was a lower identification with mother, but there was also a prominent, if less powerful, effect showing lower father identification as well. Fathers of assaulters and rapists appeared to be

aggressive toward mother and son with the latter reciprocating. The offenders reported that, in their childhood, affection received from both parents was low while their strictness was high. The sexually anomalous and rape groups were similar in reporting that their mothers were less affectionate to them and that both parents were less indulgent to them than reported by the other groups. Individual supplementary items from the Clarke PCR indicated that, compared to non-assaulters' parents, both the assaulters' and rapists' fathers were more often in trouble with the police and both their fathers and mothers were often drunk. The offenders followed in their footsteps, indicating at admission that they drank too much. Rapists and assaulters more often ran away from home as children. There was no evidence of parental sexual abuse or incest but the assaulters more often overheard parents having sex than controls did. They were also more likely to be jealous of a sibling who was father's favorite although that sibling was not necessarily a male.

Langevin, Hucker, Handy, Puren, & Russo (1985) administered the Clarke PCR to four groups of men consisting of 32 heterosexual pedophiles, 40 homosexual pedophiles, 40 bisexual pedophiles, and 54 community controls. Only six of the 16 PCR scales yielded significant differences, but four of the six were mother scales and two were father scales. Mothers were reported to be more aggressive and stricter by

heterosexual and bisexual pedophiles than by the other two groups. However, there was considerable overlap of group scores. Mothers in all pedophilic groups were reported as less affectionate than mothers of controls were. The largest differences among the groups were in mother identification. Heterosexual and bisexual pedophiles identified less with mother than the other two groups did. The father scales were not as discriminating as the mother scales, with father identification marginally weaker in pedophilic groups than in the controls. Fathers of bisexual pedophiles were reported to be more indulgent than fathers in the other three groups. The heterosexual and bisexual pedophiles had more mothers with a history of psychiatric hospitalization.

Lang & Langevin (1991) examined the extent to which disturbed parent-child relations distinguish aggressive sex offenders from non-aggressive sex offenders. The authors hypothesized that pedophiles and incest offenders who used physical force in their offenses would be more likely to show disturbed father-son relationships involving aggression than those who did not use force. One hundred eighty-one men were compared on parent-child relations, using the Clarke PCR. The sample included 66 heterosexual pedophiles, 29 homosexual pedophiles, 36 incest offenders and 50 controls. The offender groups were further identified by those who used force (20%) versus those who did not; into

those sexually victimized as children themselves (53%) versus those not victimized; and into those physically abused as children (47.5%) versus those not abused. Significantly more offenders who were both sexually and physically abused as children showed more disturbances in father relationships than offenders who were not abused during their childhoods. Collectively, sex offenders' fathers were considered more aggressive and more strict, but viewed as more affectionate to their sons. The sex offender groups identified with their fathers, but homosexual pedophiles were less inclined to do so. Only one Mother scale was significant: Aggression to Fathers. There was a trend for mothers of sex offenders in general to be more aggressive to their husbands, but not to their sons.

Substance Abuse

Alcohol has been reported to play a role in violent acts, including sexually aggressive ones. It has been implicated in about half of known rapes and in some nonviolent sexual crimes. Bain, Langevin, Wortzman, Hucker, Dickey, & Wright (1988) examined 461 male sex offenders' histories of alcohol and drug use. Subjects completed a drug survey, the Michigan Alcoholism Screening Test, and a drug abuse screening test. Most subjects had used alcohol and tried a wide range of drugs. Over half of the subjects had tried at least one street drug; marijuana being the most frequent. Over half of the subjects were alcoholics, but

less than one-fifth had a drug abuse problem. Although the majority reported positive affect in conjunction with alcohol and drug use, one-fifth to one-half reported depressed affect. Use of alcohol and amphetamines was most associated with hostile feelings, and amphetamine and hallucinogen use was most associated with paranoia. Subjects felt most out of control with cocaine and hallucinogens.

Christie, Marshall, & Lanthier (1978) found 65% of their pedophilic prison sample, and 56% of rapists, were problem drinkers or alcoholics. These findings revealed a high incidence of alcohol abuse compared to Canadians in general. In addition, 50 percent of the pedophiles and 58% of rapists noted that one or both of their parents were alcoholics or had serious drinking problems. At the time of the offense, 53% of pedophiles and 56% of rapists were noticeably intoxicated and 23% of pedophiles and 24% of rapists were drinking just prior to the offense. Nine percent of pedophiles and 18% of rapists were using drugs, mostly marijuana or prescription tranquilizers. Approximately half of pedophilic and other sexual offenders against children studied by Rada (1976) reported that they had been drinking at the time of their offense, suggesting that substance abuse may have played some role in the offenses.

Media

Over the past years, most noticeably since the advent of broadcasting, there has been debate concerning the effects of sexually explicit materials presented through the media. In 1967, the United States Congress determined that pornography was a matter of national concern and established the Commission on Obscenity and Pornography to investigate the issue. After reviewing the available research, the Commission concluded that there was no evidence that pornography had antisocial effects. Subsequent research contradicts the Commission's conclusions. Malmuth and Donnerstein (1982) described a series of experiments on the effects of aggressive pornography on behavioral aggression. They identified a variable (i.e., the outcome dimension) which seems to be of importance in explaining the contradictory findings concerning sexual responsivity to aggressive pornography. They cite data indicating that the reactions of the victim in rape scenes significantly affects the sexual arousal exhibited by members of the audience. If the victim was portrayed as becoming involuntarily sexually aroused by the assault (positive outcome), the subjects showed levels of sexual arousal both on self-reports and on penile tumescence measures, that were at least as high as those stimulated by mutually consenting depictions (Malmuth, 1980; Quincy & Chaplin, 1981). Rape portrayals that depicted the victim as continuously abhorring the experience

(negative outcome) resulted in significantly less sexual arousal than mutually consenting themes.

Malamuth & Check (1985) classified males as high likelihood to rape (HLR) or low likelihood to rape (LLR), based on their answer to a question asking their likelihood to rape if they knew they would not be caught. In Part 1, men read one of several versions of a sexually explicit story, including a rape story in which the victim becomes aroused. In Part 2, subjects were exposed to a realistic rape story in which the victim suffers. The authors found that all males exposed to the positive rape story, regardless of whether they were HLR or LLR, attributed more pleasure to the female victim in the second rape story. The groups did differ on two additional questions asked by the experimenters: What percentage of women would enjoy being raped; and what percentage of women would enjoy being forced into sex? 37% of the HLR men who had been exposed to the rape/arousal story in Part 1 reported that women would enjoy rape, and 38% reported that women would enjoy being forced. Donnerstein, Linz, & Penrod (1987) suggest that the above results are important because they suggest that the effects from exposure to aggressive pornography may be dependent upon an individual's initial attitudes about rape and other forms of violence against women. This may indicate that exposure to aggressive pornography is not necessarily "causing" positive attitudes about rape, but rather

reinforcing and strengthening already existing beliefs and values.

Legitimization of Violence

Most American homicides arise out of social conflicts between acquainted people. Daly and Wilson (1989) suggest that homicides in the United States are sufficiently numerous that one can expect transient effects of violent publicized events upon daily homicide rates. They offer as an example the research by Phillips (1983) who found a significant increase in homicides occurring a few days after heavyweight championship boxing matches. The authors state that Phillips adopted a naive view of homicide that ignores its social context. They suggest instead that young men who are already of a competitive, combative mind set identify with prizefighters, are rendered somewhat more belligerent by the aggressive dialogue surrounding the fight and are, therefore, likelier to end up dead in an escalated personal confrontation during those days when the fight is still a popular topic. Wilson and Daly offer the legitimization of violence as a more plausible explanation. When acts of violence occur and more particularly, when at least some such acts are seen to be socially acceptable, then general attitudes toward the use of violence shift in the direction of acceptance and thresholds for resorting to violence fall. Archer and Gartner (1984) consider such a legitimization process to be the likeliest explanation for postwar

increases in homicide rates. Using data on homicide rates in various countries before, during, and after various wars, these authors have provided the first truly convincing demonstration that such increases are indeed the rule. After considering various competing explanations, the "legitimation of violence model" proved to be the most viable.

Barron & Straus (1988) examined the relationship between cultural support for violence and the incidence of rape in the 50 states and the District of Columbia. Two measures were used to test the theory that, within the United States, the large differences between states are partly the result of state-to-state differences in cultural support for non-sexual and legitimate violence. They refer to their hypothesis as "cultural spillover theory". The distinctive feature of this theory is the concept that cultural support for rape may not be limited to beliefs and attitudes that directly condone rape and other criminal violence. There could be cultural elements that indirectly legitimize sexual violence. The central proposition of the theory is that the more a society tends to endorse the use of physical force to attain socially approved ends - such as order in the schools, crime control, and military dominance - the greater the likelihood that this legitimization of force will be generalized to other spheres of life, such as the family and relations between the sexes,

force received less approval. A structural model of the cultural spillover theory was tested using the Legitimate Violence Index. The indicators included in this index were selected on the assumption that if there are group differences in values concerning violence, this should be observable in many different activities, including education, recreation, and law enforcement. The indicators included in the Legitimate Violence Index are mass media, governmental use of violence, and participation in legal or socially approved violent activities. Results were replicated using the Violence Approval Index. Because it is based on directly expressed attitudes regarding circumstances under which it is appropriate to use physical force, the Violence Approval Index differs from the Legitimate Violence Index. More specifically, it is based on the percentage of persons in each state who endorsed the use of violence under each circumstance. A theoretical model hypothesizing the relationship of these two measures of legitimate violence and seven control variables to rape was developed and tested using path analysis. The results show that legitimate violence is directly related to the rape rate. The degree of social disorganization, urbanization, and economic inequality, coupled with the percent of single males, are also directly related to rape. The population's youthfulness and percent of blacks affect rape indirectly through their association with legitimate

violence. States that are high in respect to legitimate violence tend to have a larger representation of men in the violence-prone ages of 18-24 and a higher proportion of black residents. It was also found that legitimate violence is more prevalent in rural states and in states that have a disproportionate number of divorced and single men. Of the eight independent variables, the percent of males divorced emerged as the most powerful predictor of rape. The authors argued that, since marital dissolution represents a significant disruption in an individual's life, it could be argued that a heavy concentration of divorced men contributes to a social context that is conducive to rape, and/or, that divorced men tend to harbor feelings of anger, contempt, and hostility toward their estranged spouses. These feelings may become generalized to other women as well and create a climate of antagonism between the sexes. Whatever the underlying processes, it is clear that a large proportion of divorced men increases the risk of rape.

While these studies suggest that aggression can also be induced by social and environmental influences, it is important to stress the fact, however, that the effect of these influences depends to some extent on the environmental setting and the mental "set" of the organism (Elliott, 1987).

Personality Influences on Violence

Early twentieth century interest in sex and aggression is reflected in Freud's writings. His investigations concerning human behavior focused on sex during his early years as a psychoanalyst and, only much later, on aggression (Stone, 1991). Among the earliest references to aggression is the comment in the "Three Essays" (1905) on sadism and masochism. Aggression, at this stage of Freud's thinking, was intimately bound up with masculinity, with sadism and with being "active" (including sexually assertive) (Freud, 1905), while "feminine" was equated with masochism and with being "passive." Freud continued to speak of an interweaving of sexual and aggressive tendencies, but not until later did he give aggression equal status and develop a dualistic model. In 1940, he wrote of the commingling of the sexual and destructive instincts. He described sex as "an act of aggression with the purpose of the most intimate union."

A contemporary psychoanalyst proposes that violence, i.e., the pathology of aggression, is peculiar to mankind (Stone, 1991). He believes that this difference is accounted for by man's unique ability, thanks to memory and language, to think about the past and the future. He continues that, over and above temporal lobe epilepsy, serotonin deficiency, or hyperandrogenization that may provoke violent outbursts, there is learning and

anticipation. Ethnic and racial prejudice can be taught and abusive rearing can instill in one the tendency to aggress against others. Stone describes humans as ironical creatures; intensely social, unable to survive except as part of a group; with prodigious memories, and able to contemplate their own fate and death. He concludes that "much of what is terrible about us is simply the darker side of our own unique gifts" (pg. 521).

Fagan, Wise, Schmidt, Ponticas, & Marshall (1991) compared personality profiles of 51 men with sexual dysfunction to those of 51 age-matched men with a primary diagnosis of paraphilia employing the NEO Personality Inventory (NEO-PI), a measure of the five-factor model (McCrae, 1989). The principal finding that the sexual dysfunction and paraphiliac groups have different profiles on the five-factor model of personality suggests that there are stable personality features about each group. The men with sexual dysfunction had an essentially normal group personality profile. The paraphiliac men were significantly higher on Depression, Hostility, and Impulsiveness. They also reported lower Warmth and higher Fantasy.

Two major factors considered to be important in rape were examined by Langevin, Paitich, & Russon (1985): history of aggression and the presence of sexual anomalies. They hypothesized that if the rapist is basically an assaultive person he should be more similar to the common assaultive

group than to the other two groups. If he is sexually unusual rather than aggressive, he should resemble the nonaggressive sexually anomalous group more than the other two groups. If, however, rape is a fusion of aggression and sexual anomaly, there should be an interaction effect for the dependent variables in the analysis so the rapist is different from all the other groups although sharing features with both. The subjects, consisting of 40 rapists, 40 nonviolent sex offenders, 40 normal controls, and 25 nonsexual assaultive offenders, were administered the Minnesota Multiphasic Personality Inventory (MMPI). The strongest, most consistent finding was the similarity of rapists to the assaultive groups. Both groups tended to be depressed, suspicious, ruminating, worrying, confused, and higher in energy compared to non-assaultive groups. Rapists contrasted with assaultive men in having more bodily concerns, being more feminine, less energetic and more introverted. Only in the case of the Paranoia (Pa) Scale did the assaultive and rapist groups differ; the assaulters were significantly more paranoid than rapists and both were more paranoid than the nonviolent groups.

Panton (1978) compared the MMPIs of three groups of incarcerated offenders: 30 had been convicted of raping adults, 20 of raping children, and 28 non-violent child molesters. There were no significant mean scale differences between the profiles of the two rapist samples, both

implying aggravated hostility, resentfulness, social alienation, self-centeredness, and the impulsive seeking of immediate gratification. In contrast, the child molesters were self-alienated, had low self-esteem, self doubt, anxiety, were inhibited regarding acts of aggression, had an aversion to violence, a need for reinforcement from others, and feelings of inadequacy, insecurity, and fear of heterosexual failure. The motivation of the two rapist groups appeared to be more assaultive than sexual whereas the motivation of the molester group appeared to be the satisfying of sexual needs at an immature level of sexual development. The two rapist samples were considered to be of equal aggressive pathology which appeared to imply that the choice of the victim was more likely to have been a matter of immediate availability rather than a factor of the victim's age. In contrast, the choice of the victim by the child molester appeared to have been the result of the offender cultivating a relationship with a young child for the purpose of inducement precipitated by the child molester's fear of rejection and failure in adult heterosexual advances. Based on the profile configuration of the child molesters, there appears to be little danger of their resorting to violence should their sexual advances be resisted or rejected by the children involved. In contrast, the predominance of aggressive sociopathic characteristics, as demonstrated by the profiles of the adult and child

rapists, appear to support the contention that these individuals would not likely hesitate to resort to violence in order to achieve their immediate goals. The results also support the contention that the actual rape may have been the by-product of an assault initially motivated by some non-sexual connotation, whereas the motivation of the molesters appears to have been the satisfying of sexual needs. Since the results of the present study found both rapist groups to be of equal aggressive pathology, it is contended that the choice of the rape victim was more likely to have been a matter of immediate availability of the victim rather than age. On the other hand, the choice of the victim of the child molester was likely to have been the result of premeditated inducement.

Sex offenders and treatment modalities are currently matched as a function of a legally based distinction between child molesters and rapists. Hillbrand, Foster, & Hirt (1990) examined the validity of this match by comparing groups of child molesters and rapists using psychiatric, psychological, and psychosocial measures in order to determine whether these two groups actually differ clinically. Subjects were 29 male sex offenders from a Northeastern state forensic hospital. Twenty-eight subjects had been convicted of sexual assault and/or risk of injury to a minor; one subject had a well-documented history of pedophilia, yet had never been convicted. Their findings

suggest that child molesters and adult rapists constitute two distinct clinical groups. Elevated scores on measures of Insecurity, Psychological Inadequacy, Paranoia, Depression, and Passive Response to Threat, indicate that adult rapists suffer from more severe psychopathology than child molesters. These findings are at variance with the popular stereotype of the rapist as a self-assured, guilt-free, sadistic psychopath whose pathology is characterized by disinhibition. Rather, they portray the rapist as suffering from dysphoria and inadequacy, i.e., psychopathology characterized by inhibition and subjective distress.

Using the MMPI, Langevin & Watson (1991) compared 79 biological and 43 stepfathers who committed incestuous acts on their daughters. There were 79 biological fathers and 43 stepfathers. The authors noted that a higher proportion of stepfathers should have been obtained since stepfathers are reported as more likely to sexually abuse their daughters. Langevin and Watson suggest that their sample may reflect referral practices of community agencies and lawyers for treatment. The MMPI was examined for 125 derived scales which may be important in sex offenders i.e., sexual deviance, substance abuse, violence, defensiveness, personality and brain damage. Six scales would be expected to be significant by chance, but only three were; two measures of alcoholism and one defensiveness measure,

Suspiciousness. There were no significant differences between the two groups.

Langevin, Hucker, Handy, Purins, & Russon (1983) were interested in studying the personalities of bisexual pedophiles. Langevin, et.al. found that the more types of sexual preferences an individual had, the more emotionally disturbed his personality was, as measured by the MMPI. Bisexual pedophiles, for example, are of particular concern because they show sexual reactivity to both sexes. Four groups of men were in the study: 32 heterosexual pedophiles, 40 homosexual pedophiles, 16 bisexual pedophiles, and 54 community controls. All research participants were administered the MMPI. The results indicated considerable emotional disturbance among pedophiles. The Hypochondriasis, Depression, Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, and Social Introversion scales were significant in the group comparison. In five of those seven scales, there were no significant differences among the pedophilic groups but all scored higher than controls. In the cases of Hypochondriasis and Depression there was considerably greater overlap of scores with controls. Most of the difference between pedophilic groups and controls appeared on the psychotic scales. Serious emotional disturbance, confusion, rumination, and suspicion characterized all the pedophilic groups; thus there was significant clinical pathology among these groups.

Ideally, there would be an MMPI profile type associated predominantly with sex offenders. Empirical research, however, has indicated that personality is as varied among sex offenders as it is in the general population (Velasques, Callaghan, & Carillo, 1989). The use of the MMPI to identify personality traits related to criminality, in particular the antisocial personality, is problematic (Langevin, Wright, & Handy, 1990). DSM III diagnoses of antisocial personality may reflect long term criminality, which is not consistent with the diagnosis of psychopathic personality, as used in the development of the MMPI Psychopathic Deviate (Pd) Scale. The Pd scale was constructed using a criterion group of young persons between the ages of 17 and 22 diagnosed as psychopathic personality, asocial and amoral type, who were referred for testing by the courts because of their delinquent activities. None of the criterion cases was a major criminal type. The criterion group included more females than males, who engaged in delinquent behavior without planning and with little effort to avoid being caught. This scale has a mixture of items referable to criminal behavior but also family problems. It follows that the PD scale is often elevated in the criminal population but this does not necessarily indicate a high percentage

more attuned to discerning the antisocial personality, has been the Megargee, Cook, and Mendelsohn (1967) Overcontrolled Hostility (OH) Scale. Other MMPI derived scales have been developed to examine hostility, aggression, and violence, but they have not received the attention the OH Scale has (Langevin, Wright, & Handy, 1990). McCreary (1975) found that the Authority Conflict Scale, but not the OH scale differentiated child molesters with one or more previous arrests from those with no prior arrests. Deiker (1974) examined 17 experimental MMPI derived scales of hostility and control and 4 response bias scales in 168 male criminals assigned to 4 levels of aggressiveness. He found that all but one of the 17 scales differentiated the groups. These results suggest that the MMPI may be of value in distinguishing violent and nonviolent sex offenders.

Langevin, Wright, & Handy (1990), utilizing a data base of 479 sex offenders and community controls, examined six measures derived from the MMPI that assess brain damage. The data base was comprised of 14 exhibitionists, 39 homosexuals, 31 bisexuals, 29 heterosexual pedophiles, 22 homosexual pedophiles, 46 transsexuals, 27 incestuous men, 217 multiple deviants, and a control group of 54 men. Four scales had alpha over .70 and two, Brain Lesions and Neuropsychiatric Hospitalization Chronicity, were .18 or less. Five scales discriminated the offender and control groups but the Brain Lesion Scale, with only five items, did

not. Discriminations for Caudality and Epilepsy were close to chance level. No scale correlated with L,F, or K or with age. Most were moderately correlated with education and IQ, as might be expected. The authors point out, however, that the correlations were modest, suggesting these scales might have practical application.

Biological Influences on Violence

Perinatal and postnatal complications

Considerable evidence indicates that many biological and developmental disorders (e.g., reading and learning disabilities) associated with delinquency and crime may be attributable, in part, to central nervous system (CNS) dysfunction which is linked predominantly to complications occurring before and immediately after birth (for reviews, see Denno, 1982, 1985). Infants at risk - those born prematurely, with low birth weights, etc. - seem to have somewhat more difficulty adjusting to poor environments than healthy, full-term infants. It appears that the relatively less mature, or more stressed, central nervous systems of these infants are less able to become integrated in deprived circumstances (Eagle & Brazelton, 1977).

At-risk infants are not only more vulnerable to their immediate environment, they are also more prone to later CNS related disorders, including those associated with crime. These disorders include reduced intelligence or achievement, attention deficit disorder and hyperactivity, problems

associated with cerebral dominance, and learning and reading disabilities (Denno, 1982). Unfavorable environmental circumstances during childhood, such as large family size, absence of the father, late birth order, and low socioeconomic status may compound these disorders (Denhoff, Hainsworth, & Hainsworth, 1972). Likewise, CNS related deficits accompanied by subcultural or familial deprivation may impair social bonds (Denno, 1990).

A number of studies have related perinatal factors to later criminal and violent behavior. Litt (1971), in a study of 1944 consecutive births in a Danish hospital between 1936 and 1938, found perinatal trauma to be predictive of impulsive criminal offenses. Lewis, Shanok, & Balla (1979) found seriously delinquent incarcerated children to be more likely to have sustained perinatal trauma than nonincarcerated delinquent children. Similarly, Mungus (1983) found that perinatal factors were significantly related to violence in a group of psychiatric patients.

Infections

The psychopathic type of aggression has also been reported as a sequela to viral infections, which have a special impact on the limbic system of the brainstem (Wilson, 1960). This was particularly notable in the encephalitis lethargica epidemic (1917 to 1925), in which the disease apparently contributed to delinquency in

previously normal children and adolescents. (Elliott, 1987).

Vagotonia

Venables (1988) developed a new theory of violence that argues that violent offenders have an autonomic nervous system that is vagotonically tuned (i.e., favoring parasympathetic, as opposed to sympathetic, autonomic nervous system processes). Low heart rate has been found to relate to criminal and violent offending in a number of studies (Farrington, 1987; Raine & Venables, 1984; Raine et al., 1990). Venables (1988) argued that low heart rate in violent offenders reflects an excess of vagotonia and "fearlessness," which may account for the lack of inhibition of aggressive behavior. Raine & Scerbo (1991) believe that support for Venables' idea can be found in bomb disposal experts who have been decorated for their bravery and who also have significantly lower heart rates than both undecorated bomb disposal experts and soldier controls (Cox, Hallam, O'Connor, & Rachman, 1983).

Violent, aggressive behavior has also been related to dietary factors and reactive hypoglycemia (see Venables & Raine, 1987 for a review). Violent offenders with psychopathic features have demonstrated a high level of insulin secretion and are consequently more prone to insulin-induced hypoglycemia (VirKunnen, 1983). VirKunnen (1986) has found that violent offenders with a history of alcoholism are particularly characterized by reactive

hypoglycemia. Increased irritability is one symptom of hypoglycemia (Marks, 1981), and this could be a factor in the development of an aggressive outburst. Venables (1988) has integrated the diverse findings of lowered heart rate, hypoglycemia, and EEG underarousal in violent offenders by arguing that the concept of vagotonia can explain all three sets of results. Since stimulation of the vagus nerve leads to hypoglycemia via release of insulin from the pancreas, increased vagal tone in violent offenders would also be consistent with the finding of hypoglycemia in such populations (Virkkunen, 1983).

Genetics

The XYY chromosomal anomaly was thought for many years to predispose individuals to violent criminal behavior and to be associated with high levels of plasma testosterone. However, according to Elliott (1988), the correlations are not consistent and some geneticists consider the issue unsettled. A more important development is the discovery of a structural abnormality of the X chromosome associated with mental impairment from retardation to low normal intelligence, with learning difficulties, and with behavioral problems such as hyperactivity, violent outbursts, and autistic symptoms.

The peak incidence of physical violence in the home or in the streets is in late adolescence and early adult life (Bureau of Justice, 1992). Even after the age of 50,

however, pathological violence can occur for the first time in a formerly non-aggressive individual as a result of an organic brain insult, intoxication, or psychosis (Elliott, 1988). One link between youth and violence is related to androgen (e.g., testosterone) levels in both males and females, (Moyer, 1976) but there are other factors to be considered. For example, some people mature faster than others and do not acquire an adult level of self-control, foresight, judgment, and social conscience until middle age (Elliott, 1988). These functions are largely mediated by the associational neocortex of the frontal and temporal lobes, which is the last to mature in terms of myelination. This process may not be complete until the third or fourth decade (Yakovlev & Lecours, 1967). There is no information as to the rate of maturation in neurotransmitter systems but there is evidence that the formation of new synaptic connections, which are necessary for learning, can continue in the human brain until advanced ages. There also is a persistence of the bilateral slow waves of childhood in the electroencephalograms of many aggressive adult psychopaths. This is consistent with the theory of maturational lag advanced by Kraepelin (Elliott, 1988).

Males are more often prone to violence than are females in primates (including humans) and other animals (Elliott, 1988). The author further states that there are gender determined differences in brain anatomy, cognitive skills,

speed of maturation, and behavior. As a result, males are more susceptible to conditions that can be warning signs of pathological aggression. These include episodic dyscontrol syndrome, attention deficit disorder, and antisocial personality disorder.

Endocrine Abnormalities

The majority of studies available on sex hormones in sexually anomalous men have been done on homosexuals (see Bain & Langevin, (1985) for a review) with only a few studies of sexually aggressive heterosexuals and pedophilic offenders. Langevin, Hucker, Dickey, Wright, & Schonberg (1988) examined 26 men who had been referred for assessment and treatment in reference to a sexual offense against male and female children. A control group of 16 nonviolent non-sex offenders was used for comparison with pedophiles and served to control for offender and patient status. The controls faced charges, or were convicted, of fraud or property offenses. The subjects were compared on baseline values of Lutenizing hormone (LH), follicle stimulating hormone (FSH), testosterone, estradiol, dehydroenpiandrosterone sulphate (DHEAS) and cortisol. Pedophiles had significantly higher levels of LH and FSH but lower levels of testosterone. There were no significant differences on the remaining hormones. When age and substance abuse were controlled, LH and FSH differences were not statistically significant but testosterone differences

remained and pedophiles then demonstrated lower levels of cortisol. In a second study, 26 pedophiles and 14 healthy community controls were compared on the gonadotropin releasing hormone (GnRH) test. Blood was sampled for LH and FSH at intervals of 0,15,20,45,and 60 minutes after injection of GnRH. There were no group differences in baseline values of LH or FSH. Pedophiles, however, showed greater increases in LH (but not FSH) than controls after GnRH injections. Results were similar when age, substance abuse and baseline levels of testosterone were taken into account.

The administration of testosterone increases aggression in both sexes, while castration reduces sexual and irritable aggression in males (Kolb & Wishaw, 1990). In one study, higher levels of testosterone were found in violent female felons than in nonviolent control subjects (Ehlers, Rickler, & Hovey, 1979). Additionally, androgen suppressing drugs can reduce male urges to commit sexual offenses against children (Moyer, 1976).

Langevin, Bain, Wortzman, Hucker, Dickey, & Wright (1988) examined sex hormone profiles in 49 cases of sexual aggression and 31 controls. The results suggested that the adrenal axis of the endocrine system might be important in sexual sadists and nonsadistic sexual aggressives. The weak androgen, DHEAS, was found to be elevated in sexual aggressives generally, versus a control group of nonviolent,

non-sex offenders matched for age and education. There was a trend for cortisol to be higher, and prolactin lower, in sexual aggressives, as well. Testosterone, however, was not significantly different in these groups. The nonsadistic sexual aggressives had higher levels of testosterone than the sadists or controls. The authors attributed this latter finding to the results of sex hormone analyses in aggressive groups being frequently confounded due to their high incidence of substance abuse.

Studies of the cerebrospinal fluid (CSF) serotonin metabolite (5-HIAA) in depression, impulsivity, and violence can generally be divided into five groups: pharmacologic studies, CSF studies, postmortem studies, neuroendocrine studies, and family-genetic studies. A number of these indicate that functions of the central serotonergic system (5-HT) may be altered in humans with aggressive/impulsive behaviors. According to Brown & Linnoila (1990), these reports constitute one of the most highly replicated findings in biologic psychiatry.

Abnormalities in the 5-HT system have been associated with criminal offenders; specifically, reduced cerebrospinal fluid 5-HIAA concentrations have been associated with a history of violent acts and/or impulsivity in violent criminal offenders (Linnoila, Virkunen, Scheinin, Nuutila, Rimon, & Goodwin, 1983). This data suggests that a dimension of disinhibited aggression directed at others may

be associated with alterations in observed indexes of central 5-HT dysfunction.

Neuropsychological Influences on Violence

Neural Substrates of Violence

Experimental clinical studies have shown that the capacity for aggression, and for its control, is vested in a system of neuronal assemblies, both excitatory and inhibitory (Elliott, 1992). This system is believed to be situated bilaterally in the orbitofrontal cortex, hippocampus, hypothalamus, anterior lobe of the cerebellum, amygdala, dorsolateral prefrontal cortex, temporal lobe, and the basal ganglia. Under normal conditions, the neocortex also exerts some degree of control over this system, but its inhibitory capacity is fragile and can break down in the face of overwhelming endogenous drives or exogenous provocation, even in normal individuals (Elliott, 1992).

Yeudall & Flor-Henry (1975), in an extensive neuropsychological investigation of aggressive criminals, found that 76% of such subjects had dysfunction localized to the frontal and temporal regions of the brain. Of these, 79% showed fronto-temporal abnormalities lateralized to the left hemisphere. Similar localization to the dominant temporal lobe in violent adolescents has been reported by Yeudall (1978), who used this neuropsychological evidence of anterior temporal dysfunction to implicate the limbic regions of the temporal lobe, in particular, the amygdala

and hippocampus. Specific brain areas purported by Yeudall to be dysfunctional include the dorsolateral prefrontal cortex, orbitofrontal cortex, temporal cortex, basal ganglia, hypothalamus, amygdala and hippocampus.

Using CT scan, Langevin, Bain, Wortzman, Hucker, Dickey, & Wright (1988) discovered that the overall incidence of gross pathology among sexual aggressors was no different from that found in a nonsexual nonaggressive offender group. However, it should be recalled that the temporal lobes in particular have been implicated in unusual sexual behavior. When the temporal lobes specifically were examined, it was consistently found that the sexual sadists have right temporal horn dilation. Forty-one percent of the sadists showed this abnormality, compared to 11% of nonsadistic sexual aggressives and 13% of controls; these results reflect a statistically significant difference.

Kolarsky, Freund, Machek, & Polak (1967) proposed that lesions of known duration, irrespective of localization, are more frequent among sex offenders as compared to non-sex offenders. In 1982, Graber, Hartman, Coffman, Huey, & Golden examined the structural and functional integrity of the cerebrum in sexual assaulters. These investigators found impaired neuropsychological performance, decreased cerebral blood flow, and decreased brain density in a significant number of subjects.

Haugh & Markesbery (1983) suggested that the human

hypothalamus contributes to aggression. Neoplasms which bilaterally destroy the ventromedial hypothalamic area in patients have been accompanied by attacks on attendants which are strikingly reminiscent of animal aggression following ventromedial lesions. According to Weiger & Bear (1988) there are distinctive alterations in aggressive responses which result from pathology in three separate areas in the brain, suggesting that violence might result from specific lesions. Acts of violence committed by patients with ventromedial hypothalamic lesions, and by temporal lobe epileptics in the ictal or immediately postictal period, are similar in their lack of direction and complexity. An unprovoked attack might occur on whomever happened to be near the offender. An individual with a hypothalamic lesion would be likely to remember the attack while epileptics whose seizure involved the hippocampus would be amnesic for the event. The authors further explained that patients with frontal lesions tend to react in response to minor provocation and are generally incapable of planning a complex crime which involves an extended sequence of actions. This lack of planning, combined with limited foresight as to the possible consequences of their actions, would probably lead to rapid apprehension by police, though the literature does not specifically address this question. Although they remember their actions, their lack of remorse combined with difficulty in mentally

connecting the crime with the resultant punishment might lead to repeat offenses and resistance to rehabilitation.

Elliott pointed out that patients with orbitofrontal lesions show many similarities to the psychopath (Elliott, 1978). He observed that some adult psychopaths show bilateral frontotemporal theta activity on EEG which is normally present only in children. He, therefore, suggested that one cause of psychopathy might be a maturational lag in frontal lobe development.

Episodic Dyscontrol Syndrome

The term "episodic dyscontrol" corresponds to the intermittent explosive disorder described in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (American Psychiatric Association, 1987), and is viewed as a potential contributor to unpremeditated homicide, suicide, attacks on strangers, spouse battery, child abuse, criminally aggressive driving, wanton destruction of property, and savage attacks on animals (Monroe, 1978). This syndrome was first described by Kaplan (1899) as the result of severe head injuries. The "episodic dyscontrol syndrome" was named by Karl Meninger, who noted that individuals who were subject to recurrent attacks or rage in response to minor provocation often had a history of illness or injury involving the nervous system (Monroe, 1978). In patients with episodic dyscontrol, there is little warning of the drastic change in personality or of the ensuing

violence, which often has a primitive quality (e.g., gouging, kicking, clawing, and spitting). These episodic dyscontrol attacks are carried out with power and speed such that the victim may have difficulty escaping. In some cases the violence is verbal, with language becoming uncharacteristically obscene and profane.

In 102 out of 286 cases studied by Elliott (1982), the condition developed for the first time following a specific brain insult, which included severe head injury, encephalitis, stroke, brain tumor, multiple sclerosis, cerebral anoxia, or recurrent hypoglycemia. In the remaining 184 cases, the explosive behavior had been present since early life and was most commonly associated with the syndrome of minimal brain dysfunction. Other correlates were perinatal disease, persistent generalized convulsions in infancy, psychomotor epilepsy, and unexplained cerebral illnesses during early life.

Mark & Ervin (1970) describe the syndrome as involving hyperaggressivity, pathological intoxication, and impulsive sexual behavior. They suggest that this syndrome may be related to limbic system dysfunction or, more specifically, to the failure of the cortical structures of the limbic system to inhibit impulses. During interviews, sexual assaulters frequently described the rape as an impulsive behavior that sometimes occurred during an argument, or while committing another illegal act such as robbery. This

is consistent with the hypothesis that forcible sexual assault may be, in part, a result of poor judgment and poor impulse control in persons with episodic dyscontrol syndrome.

Monroe (1976) makes reference to episodic sexual disorders. He stated that when the compelling need for genital orgasm overrides appropriate postponement it becomes an episodic sexual disorder, since the sexual act becomes either personally, interpersonally, or socially destructive. He described episodic behavioral disorders as entailing: (1) a single explosive act (episodic dyscontrol); and (2) a more prolonged aberration characterized by many dyscontrol acts and other symptoms suggesting psychotic, neurotic, sociopathic, or physiologic disorders (episodic reactions).

Minimal Brain Dysfunction

The syndrome of minimal brain dysfunction (MBD) has been recognized as a common antecedent of psychopathology in adolescents and adults. Prospective and retrospective studies have confirmed that a substantial proportion of MBD children become criminals, alcoholics, hysterics, or atypical psychotics (Elliott, 1982). In many people, this was the result of a variety of anatomical defects which included vascular malformations and hamartomas, (benign tumor-like nodules composed of an overgrowth of mature cells and tissues that normally occur in the affected part, but often with one element predominating), patches of gliosis in

the cortex and white matter, ectopic groups of neurons in the white matter, and multiple patches of cortical dysplasia (Taylor, Falconer, Burton, & Corsellis, 1971). Elliott (1982) reported on 286 patients with a history of attacks of uncontrolled rage with little or no provocation, dating either from early life or following identified brain insult after the age of 15. Of these subjects, 94% showed evidence of organic disorders of the brain, whether acquired or developmental. The CT scan, though not available in the early phase of the study, disclosed abnormalities in 41 of 148 cases. The EEG, carried out with scalp electrodes and supplemented by nasopharyngeal electrodes and sleep records in some cases, was abnormal in 60.8% of 245 patients.

Attention-deficit-hyperactivity disorder (ADHD) was originally linked with specific learning disorders and a heterogeneous collection of cognitive, perceptual, motor, and behavioral disorders that constituted the minimal brain dysfunction syndrome. This complex has been subdivided into the hyperactivity disorder, the attention deficit disorder, specific learning difficulties, and minor motor disabilities. There is much overlap, however, between these components. ADHD is a common antecedent of episodic dyscontrol and other forms of antisocial conduct which may persist into adult life. It is viewed as a developmental condition that is generally chronic in nature, has a strong biologic and hereditary predisposition, and has a

significantly negative impact on the academic and social outcomes for many children (Berman, 1979). In adults with residual ADHD, global cerebral glucose metabolism is lower than in normal control subjects with significantly reduced values at 30 to 60 sites tested in the cerebrum. The multiplicity of affected areas suggest a developmental defect in a diffuse system; for instance, one involving cortical and subcortical inhibitory mechanisms (Elliott, 1992). This could help explain those cases of ADHD in which disinhibitory behavior presents in forms other than inattention and hyperactivity such as acting on impulse without "reflective delay" (Robins, 1966). Disinhibition may also appear in the form of substance abuse, excessive traffic violations, theft, and sexual offenses. This is true of many prisoners convicted of violent crimes whose histories are remarkable for episodes of impulsive antisocial behavior (Lewis & Jackson, 1985).

Left Hemisphere Dysfunction Theory

The traditional left-hemisphere dysfunction theory of violence argues for a type of structural damage to the left hemisphere that can be detected by neuropsychological tests validated against patients with known brain lesions. Deficits tend to involve functions of language (Mungus, 1988), verbal comprehension, and expressive speech (Hart, 1987).

Nachson & Denno (1987) examined the distribution of

hand, eye, and foot preferences among violent and nonviolent offenders. For these groups, there were no significant differences between right-hand preferences and right-foot preferences. However, significant group differences emerged for eye preference, with violent offenders preferring the left eye. The most frequent overall pattern for the violent offenders was right-hand and foot preferences, and left-eye preference, whereas the non-violent offenders preferred right hand, foot, and eye. The authors interpreted this pattern as indicating the existence of left-hemisphere dysfunction among violent offenders.

A more recent theory of violence proposes that violent individuals are less lateralized for speech and language processes. According to Raine & Scerbo (1991) an important advantage of the reduced lateralization theory over traditional left-hemisphere dysfunction theories is that reduced lateralization is more likely to be developmental in nature and not itself caused by violence.

Wright, Nobrega, Langevin, & Wortzman (1990) analyzed CT scans of 34 sexually aggressive men who had sexually assaulted adult females, 18 pedophiles, 12 incest offenders and 12 nonviolent non-sex offender controls. Brain area and optical density were computed for each hemisphere and for four sections within the hemispheres at the level of the temporal horns. Brain length and width was also computed, using the pineal gland as reference. From the width

measures, an index of brain symmetry was computed. Results showed that the brains of sex offenders were relatively smaller in the left hemisphere compared to controls, but there were no significant group differences in optical density. There were no subgroup differences in brain area but the segments corresponding to the left frontal and temporal areas were smaller in sex offenders than controls. There were no significant differences in brain length but sex offenders had smaller widths in both hemispheres than controls. Analysis of symmetry showed that 66.7% of pedophiles and 53.1% of sexual aggressives had asymmetric brains compared to 8.3% of incest offenders and 20.0% of controls. Pedophiles showed smaller left hemispheres than right whereas sexual aggressives were equally split between left and right asymmetry.

Antisocial Personality Disorder

This disorder connotes a particularly malign combination, (i.e., impulsivity, aggression, lack of empathy, and lack of foresight), is not uncommon after head injury or encephalitis, and occurs in a subset of the minimal brain dysfunction population. It is found at all social levels, and in gifted individuals as well as in the mildly retarded (Elliott, 1992).

A neuropathologic substrate is indicated by abnormal responses to neuropsychological tests designed to detect organicity, nonspecific electroencephalographic

abnormalities in a majority of aggressive cases, resistance to aversive condition, low levels of serotonin metabolites in the spinal fluid of adult psychopaths, and a low level of serotonin in the platelets of children with aggressive conduct disorder. Minor neurologic abnormalities are often present. In a study of 93 violent criminals, whose collective profile was that of the psychopath, 40% had EEG and/or neurologic abnormalities, including incoordination, dyspraxias, congenital stigmata, hyperactivity, hyperacusis, and photophobia (Robins, 1966).

Yeudall (1977) espoused that brain dysfunction of the frontal and temporal regions may be a necessary, but not a sufficient factor in the development of habitual criminal behaviors. In order to study forensic patients who were not psychopathic, 25 criminal patients with a diagnosis of severe personality disorder with affective features were consecutively selected from the neuropsychological files. In contrast to the psychopathic groups, they showed a greater proportion of lateralized deficits for the nondominant (right) cerebral hemisphere. 91% of the psychopaths also showed significant neuropsychological impairments, based on clinical interpretation of the test profiles. Consistent with the clinical findings were the discriminant function analyses, based on scores from the Wechsler Intelligence Scale and neuropsychological test variables, which correctly classified 88.5% of the

psychopaths. A significant finding was the localization of the dysfunction in the temporal and frontal regions of the brain, with the psychopaths showing a greater incidence of dominant (left) hemisphere dysfunction.

Neuropsychological Assessment

Scott, Cole, McKay, Folden, & Liggett (1984) administered the Luria-Nebraska Battery (LNNB) to persons who had been arrested for sexual assault. Their results were compared to those of a group of normal controls consisting of nonhospitalized volunteers, hospitalized volunteers, and hospitalized persons without histories of psychiatric and neurological disorders. The sexual assaulters performed significantly worse on 7 of the 14 scales of the battery. Subjects were then broken down into three groups: (1) those who had forcibly assaulted postpubescent victims; (2) those who had sexually molested a prepubescent child, and; (3) normal controls. A subsequent discriminant analysis survey correctly classified 68% of the subjects solely on the basis of their neuropsychological performance alone. The results of this study suggest that a large proportion of persons arrested for sexual assault may have underlying cerebral dysfunction identifiable by neuropsychological testing.

Bryant, Scott, Golden, & Tori (1984) examined the relationship between neuropsychological functioning, learning disability, and violent behavior. Subjects were

110 inmate volunteers selected from among those admitted to the California Medical Facility at Vacaville, California, and the Lincoln Regional Center at Lincoln, Nebraska. Violent subjects were defined as those with assaultive crimes against persons. A control group of nonviolent inmates had convictions for property-related offenses. The results support the contention that violent criminal offenders have serious neuropsychological deficits. Significant differences were found between the groups on all summary scales of the LNNB. These findings are in accord with the research of Spellacy (1978) and Bach y Rita, Climent, & Ervin (1978). Bryant et.al., reported that on four of the LNNB scales (Writing, Reading, Arithmetic, and Intellectual Processes), the mean scale scores of the violent group were within the pathological range. The violent group demonstrated impaired performance on tasks requiring complex integration of information from the visual, auditory, and somesthetic processing systems; the transition from sensory schemata to higher level symbolic processes; the ability to create, plan, organize, and execute goal-directed behaviors; and sustained attention and concentration.

Hucker, Langevin, Dickey, Handy, Chambers, Wright, Bain, & Wortzman (1988) utilized the LNNB, Wechsler Adult Intelligence Scale-Revised (WAIS-R), and CT scans in evaluations of 51 men charged with, or convicted of, sexual

assault on an adult female and compared these with 36 controls consisting of nonviolent, non-sex offenders. The sexual assaulters were further classified as 22 sadists and 21 non-sadists on the basis of clinical interview, criminal history and a standardized sex history questionnaire. Fifty-four percent of the sex offenders versus 16% of controls showed a significant result in an impaired direction on at least one LNNB subscale.

Langevin, Ben-Aron, Coulthard, Hessman, Ourins, Handy, Hucker, Russon, Day, Roper, Bain, Wortzman, & Weber (1985) evaluated 20 sexual aggressors who were charged with rape, attempted rape, or indecent assault. They were matched with a group of 20 nonviolent, non-sex offenders charged with theft, fraud, and possession of drugs. Significant differences were found on Speech Perception, Trails, and the Halstead Impairment Index with the sex offenders showing more impairment than the non-sex offenders. The results could not be explained on the basis of previous head injury.

Finally, Hucker, Langevin, Wortzman, Bain, Handy, Chambers, & Wright (1986) conducted a study in which heterosexual, homosexual, and bisexual pedophiles were compared to nonviolent, non-sex offenders using the Halstead Reitan Neuropsychological Test Battery. Sixty-seven percent of pedophiles showed some pathology, either on CT scan or the HRNTB, versus only 17% of controls.

The existing literature indicates that a large

proportion of persons convicted of sexual assault display some evidence of cerebral dysfunction. It is apparent, however, that not all sexual assaulters display such dysfunction. While neuropsychological functioning appears to be an important variable in understanding sexual assault, it is clearly not the only variable. One of the objectives of neuropsychological research dealing with sex offenders should be to identify individuals whose neuropsychological dysfunction places them at risk for maladaptive behavioral responses to environmental influences. Attempts to understand the ways in which individual differences in neuropsychological functioning interact with social/environmental, personality, and biological influences to increase the probability that deviant sexual acts will occur is paramount. Are specific types of offenses associated with specific patterns of neuropsychological deficit? Are offenses of the neuropsychologically impaired more likely to be violent? Can neuropsychological data assist in the classification of these subtypes? Of particular importance, can neuropsychological tests be utilized to assist in the identification of individuals who are at risk for offending in a preventive fashion? Failing this, can understanding an offender's cognitive strengths and deficits contribute to treatment planning?

The present study will investigate the following hypotheses:

(1) There is a significant difference in the neuropsychological functioning of violent sex offenders, nonviolent sex offenders, and nonviolent non-sex offenders;

(2) There is a significant difference in the neuropsychological functioning of violent non-sex offenders, nonviolent non-sex offenders, and nonviolent sex offenders.

(3) The neuropsychological functioning of violent and nonviolent sex offenders will correctly classify these two groups.

Additionally, the study will attempt to identify social/demographic variables i.e., education, race, and personality traits that may distinguish between offenders.

Method

Subjects

Four groups of adult male offenders were identified: violent sex offenders (group 1), nonviolent sex offenders (group 2), nonviolent non-sex offenders (group 3), and violent non-sex offenders (group 4). Violent sex offenses are defined in accordance with the Severity of Offense Code (DOP 823), Virginia Department of Corrections (DOC), as sexual assault, rape, sexual assault sodomy, sexual assault-carnal abuse, and sexual assault-attempted (with intent). Nonviolent sex offenses are categorized as statutory rape, sexual battery, sex offense against minor-fondling, indecent exposure, bestiality, peeping Tom, and indecent liberties (with intent to act). Nonviolent non-sex offenses include all other felonies. Violent non-sex offenses are murder, conspiracy to commit murder, homicide, conspiracy to commit homicide, kidnap, abduction, arson-endangered life, robbery-weapon, attempted robbery-weapon, malicious wounding, and unlawful wounding. A review of DOC records ensured that all participants had at least a sixth grade reading level. Offenders with a history of seizure disorder, brain tumor, hospitalization for head injury, or inpatient treatment for substance abuse were excluded from the study, as were subjects taking psychoactive medication. Additionally, nonviolent offenders with a prior conviction for a violent offense were not eligible for participation, nor were non-

sex offenders with a previous conviction for a sex offense. An effort was made to obtain a racial distribution within each group of approximately 60% black and 40% white, in order to be representative of the distribution within the state's correctional facilities. This proved impossible, as the distribution of nonviolent sex offenders within the prison system at the time of subject selection was 17% black and 74% white. Consequently, group 2 was 17% black and 83% white. The experimental group was comprised of 93 convicted felons, 25 from groups 1, 3, and 4 and 18 from group 2. The subjects ranged from 21 to 53 years of age at the time of data collection, and were incarcerated within Department of Corrections facilities.

Procedure

The proposal was presented to, and approved by both the DOC Human Research Review Committee and the Eastern Virginia Medical School Institutional Review Board. Three major institutions were selected for participation. Four hundred seventeen records were reviewed in DOC's central records office. Ninety three potential subjects and 37 alternates were selected for study. The DOC Research and Planning Unit contacted the warden at each participating prison and notified them of approval of the research project. Each warden was then contacted by the researcher and issues regarding scheduling, procedure, and accessibility to subjects were formalized. Eight examiners in addition to

the principal researcher assisted with data collection. All had a minimum of a Bachelor's degree in psychology and were trained and observed by a doctoral-level neuropsychologist before beginning data collection. The MMPI-2 was administered in group form. The remainder of the measures were administered individually. Standard procedures described in the test manuals were used.

In an effort to reduce experimenter bias effects and to ensure subject confidentiality, all researchers were "blind" to which group each subject belonged. To further ensure anonymity, upon completion of data collection names were converted into code numbers for later statistical analysis. All measures were scored by the principal researcher. Mean scores for data collected by the Neuropsychological Data Inventory (i.e., age, race, education, hand, foot, arm, and eye laterality) as well as all test scores rendered as means or percentiles, were converted into T scores, thus permitting analysis with parametric statistics.

Of the original pool of 93 subjects, one from group 1 refused to be tested because he believed that the examiners had been sent by a current Gubernatorial candidate. Four group 2 subjects refused; the reasons provided were: still currently in litigation; "too intelligent" to participate and, in two cases, disinterested due to imminent release on parole. These were replaced by inmates on the alternates list. Additionally, during the course of data collection,

39 of the original subjects were either transferred to other institutions or paroled. The DOC accommodated two subsequent visits to their central office for further file review and subject replacement. As a result, a total of seven institutions participated in the study. Among those interviewed for final selection from groups 1, 3, and 4, 23, 24, and 23, respectively, were included. One subject in group 1 was excluded due to three undocumented head injuries, all including loss of consciousness. The other was not selected as a result of stab wounds to the right hand and wrist and right and left shoulders that still caused him pain. A gunshot wound to the head at age 14 caused one subject to be eliminated from group 3. A subject from group 4, placed on Lithium and Mellaril since his incarceration to "control his anger", was also eliminated, as was one with a previously undiagnosed case of Tourette's Syndrome. All 18 of the final targeted participants in group 2 were included, resulting in an N of 88.

Of the sample of 88 subjects who participated in neuropsychological testing, 50 were accessible for testing with the MMPI-2. Of the 38 who did not report, ten were given unauthorized permission forms by the host institution, four refused, eight were paroled, two were ill, and the remaining 17 had been transferred to other facilities. Of the remaining 50, three refused to complete due to test length, four were discarded due to questionable validity

(T scores = 79-82 on Scale F,) and three due to probable invalidity (T scores = 92-122 on the F scale), resulting in an N of 41.

Measures

Demographic/Neuropsychological Data Inventory (Appendix A-1) was developed by the researcher to gather basic demographic information, to check for factors that might be indicative of neuropsychological symptomatology or history that did not manifest during the selection process, and to determine laterality. To assess hand and eye laterality, a cylinder, four inches in length and one and three-fourths inches in diameter was placed on the table in front of each subject. He was instructed to pick it up and look through it as though it was a telescope. To assess for arm and foot laterality, the subject was asked to stand, demonstrate how he would throw a baseball, then asked to demonstrate how he would kick a ball (Reitan, 1974).

The Shipley Institute of Living Scale (Shipley, 1939) (Appendix A-2) is used in clinical and research settings as a rapid screening test of current intellectual functioning. It consists of two subtests - a 40-item vocabulary test and 20-item abstraction test, each with a 10-minute time limit. The vocabulary subtest utilizes a multiple-choice format and requires the subject to select a synonym for each target word from among four possible choices. The abstraction subtest is comprised of semantic and numerical sequences

which must be analyzed and then completed by the examinee.

The Wechsler Memory Scale-Revised (WMS-R) (Wechsler, 1987 Logical Memory and Visual Reproduction (Appendix A-3) measure immediate and delayed recall of auditory-verbal and visual-graphic information, respectively. For the former, subjects are read paragraph-length stories and recall is immediately solicited. For the latter, subjects are presented with three separate cards, each displaying geometric designs that are exposed for a period of ten seconds per card. After each card is removed, the subject is asked to draw the figure as it appeared on that card. Recall (material is not re-presented) of both stories and drawings is again solicited 30 minutes later.

The Wechsler Adult Intelligence Test-Revised (WAIS-R) (Wechsler, 1981) Digit Span and Digit Symbol Subtests (Appendix A-4). Digit Span requires immediate recall of increasing lengths of digits in both forward and backwards order. It is a measure of auditory discrimination, attention, concentration, and immediate recall and is among the WAIS-R subtests more sensitive to brain dysfunction. Digit Symbol is a speeded symbol matching task of 90 seconds duration which assesses attention, concentration and visual motor coordination. It is the WAIS-R subtest that is usually most sensitive to brain dysfunction.

Controlled Oral Word Association Test (COWA) (Spren & Benton, 1977) (Appendix A-5) is a test of verbal fluency,

consisting of three word one-minute naming trials, each of which requires the subject to say as many words as he/she can think of that begin with a given consonant.

Finger Tapping (FTDOM; FTNON (Reitan, 1969) is part of the Halstead-Reitan Neuropsychological Test Battery (HRNTB) and requires the subject to tap as rapidly as possible with each index finger on a small lever attached to a mechanical counter. The test is a measure of simple motor speed, although some degree of kinesthetic ability is necessary for successful performance.

The Trail Making Test, (Trails A; Trails B) (Reitan, 1986) (Appendix A-6) is a speeded measure of visual sequencing and mental tracking, and is a part of the HRNTB. Trails B performance has been found to be particularly vulnerable to the effects of brain dysfunction. Trails A requires the subject to draw lines to sequentially connect circles numbered from 1 to 25, which are arrayed randomly over an 8 1/2 by 11 inch sheet of paper. Trails B requires the subject to draw lines to connect 13 numbers and 12 letters in alternating sequence (i.e., from 1 to A, from A to 2, from 2 to B etc.). The test assesses visual-motor speed and coordination as well as divided attention and the ability to attend to shift set.

The Hooper Visual Organization Test (HVOT) (Hooper, 1983) (Appendix A-7) is a 30-item, motor-free measure of visual organization in which the subject is asked to name

objects from drawings of their disassembled pieces.

Minnesota Multiphasic Personality Inventory - 2 (MMPI-2), (Hathaway & McKinley, 1989) is the most recent revision of the original MMPI. It was developed to assess major personality characteristics that reflect an individual's social and personal adjustment and that can be indicative of psychological abnormality. It consists of 567 true/false items.

Results

Neuropsychological Testing

Using the three demographic variables of Age, Race, and Education, the three variables to assess laterality (hand, eye, arm, foot) and the fifteen neuropsychological test scores as the dependent measures, analyses of variance were performed with type of offense (violent sex offender, nonviolent sex offender, nonviolent non-sex offender, violent non-sex offender) as the independent measures. Table 1 presents the mean scores and standard deviations for demographic data by group; Table 2 the mean T-Scores for demographic and neuropsychological data.

Insert Tables 1 & 2 about here

There were main effects for Race, Logical Memory II (LMII), Visual Reproduction (VRI), Visual Reproduction (VRII) II, Hooper Visual Organization Test (HVOT), The Shipley Institute of Living Scale Vocabulary (SHIPVOC), The Shipley Institute of Living Scale Total (SHIPTOT), Digit Span (DIGSPAN), Digit Symbol (DIGSYM) and Finger Tapping dominant and non-dominant (FTDOM, FTNON). The results of the analysis are summarized in Appendix B-1.

Three subtests of the Wechsler Memory scale were significant. Nonviolent sex offenders scored higher than violent sex offenders and nonviolent non-sex offenders on

LMII. On VRI, violent sex offenders scored lower than all other groups. Nonviolent non-sex offenders and violent non-sex offenders were not different from each other. Nonviolent sex offenders scored higher than all other groups on VRII. There was no difference between violent sex offenders, violent non-sex offenders and nonviolent non-sex offenders. On the HVOT, violent sex offenders and non-violent non-sex offenders scored higher than nonviolent sex offenders and violent non-sex offenders.

Nonviolent sex offenders and violent non-sex offenders scored higher on SHIPVOC. Nonviolent non-sex offenders and violent sex offenders were not different from each other. SHIPTOT results revealed that nonviolent sex offenders and violent non-sex offenders scored higher than violent sex offenders and nonviolent non-sex offenders, who were not different from each other.

The two subtests of the WAIS-R served to distinguish between groups of offenders. On DIGSPAN, nonviolent sex offenders scored higher than violent sex offenders and nonviolent non-sex offenders. There was no difference between violent non-sex offenders and nonviolent non-sex offenders. Nonviolent non-sex offenders scored lower than all other groups on DIGSYM. There was no difference between the violent sex-offenders and violent non-sex offenders.

Nonviolent sex offenders and violent non-sex offenders were not different from each other on FTDOM but scored

higher than both the violent sex and nonviolent non-sex offenders. On FTNON, violent sex offenders scored lower than all other groups. Nonviolent sex offenders scored higher. There was no difference between the nonviolent non-sex offenders and violent non-sex offenders.

A General Linear Models Procedure identified Race as a factor with White subjects scoring higher on LMII, VRI, VRII, and SHIPVOC. Black subjects scored higher on the HVOT. Table 3 describes the results for grouping by Race.

Insert Table 3 about here

In an effort to identify the correlates associated with the four categories of offenders, a stepwise discriminant analysis was conducted. Twenty-two predictor variables were used; the three demographic variables, the four variables to assess laterality, and the fifteen neuropsychological test scores. For each analysis the four offender groups were used as the criterion. Using a significant F-ratio and a partial R^2 as the selection criteria, four variables emerge as significant contributors: Finger Tapping Dominant Hand (FTDOM) (0.302), Logical Memory II (LMII) (0.207), Arm Laterality (0.075), and The Trail Making Test, Part A (Trails A) (0.069). Table 4 describes the analysis.

Insert Table 4 about here

Further analysis with a Linear Discriminant Function concluded that 52.17% of violent sex offenders (group 1), 77.78% of nonviolent sex offenders (group 2), 47.83% of nonviolent non-sex offenders (group 3), and 39.13% of violent non-sex offenders (group 4) were correctly classified by the administered measures.

Personality Testing

Using three validity scales of the MMPI-2 (L,F,K) and the 10 clinical scales (HS,D,HY,PD,MF,PA,PT,SC, MA, SI) as the dependent measures, analyses of variance were performed with type of offense as the independent measures. Table five summarizes the mean scores by scale.

Insert Table 5 about here

There were main effects for Scales F and 9 (mania). The analysis is summarized in Appendix B-2. Post hoc analyses with the Student-Newman-Keuls test identified violent sex offenders and nonviolent sex offenders as different from violent non-sex offenders and nonviolent non-sex offenders and different from each other on Scale F. On scale 9 (Mania), nonviolent sex offenders were different from all other groups. Table 6 describes the results.

In an effort to identify the correlates associated with the four categories of offenders, a stepwise discriminant analysis was conducted. Thirteen predictor variables (the three validity scales and the 10 clinical scales) were entered. Using a significant F-ratio and a partial R^2 ratio as the selection criteria, Scales F (0.463) and 6 (0.435) emerge as significant contributors. The results are depicted in Table 7.

Discussion

The offenses committed by the subjects in this study involve a violation against another individual, whether it be designated as a nonviolent or violent offense. The degrees of offenses carry significantly different import, however, both to the victims and the legal system. The first purpose of the present study was to ascertain whether a difference exists between violent sex offenders, nonviolent sex offenders, and nonviolent non-sex offenders in terms of neuropsychological functioning when potential precursors of impairment are controlled. The attempt to do so was successful, as none of the groups displayed neuropsychological impairment. There were significant differences between groups, however, with group 2 (nonviolent sex offenders) scoring higher on four of the fifteen neuropsychological measures than all other groups, supporting the first hypothesis that a difference would exist between violent sex offenders, nonviolent sex offenders, and nonviolent non-sex offenders. Group 2 shared significant scores with group 4 (violent non-sex offenders), on three other measures, which was not predicted by the second hypothesis. Group 2 also differed on one demographic variable (race) and two MMPI-2 scales (F and 9). Regarding the third hypothesis, neuropsychological functioning correctly classified violent sex offenders with a percentage rate of 52.17, and nonviolent sex offenders with

a rate of 77.78.

Group 2 scored significantly higher than all other groups on VRII while group 1 scored lower on VRI, both subtests of the WMS-R. VRII is a test of delayed memory of figural material and suggests that group 2 may have a subcortical right hemisphere advantage, most likely focused in the temporal lobe (Golden, Zillmer, & Spiers, 1992). VRI measures immediate memory of figural material and is sensitive to right hemisphere damage (Berg, Franzen, & Wedding, 1987). Spatial thinking, integration of parts into wholes and spatial memory are among the tasks of this hemisphere, particularly the temporal lobe. Lower functioning in this area may result in the person experiencing difficulty in remembering visually-oriented material.

In relation to group 2, this finding is consistent with previous experimental clinical studies which have shown that the capacity for aggression and its control is housed in a system of neuronal assemblies, including the temporal lobe (Elliott, 1992). Yeudall & Flor-Henry (1975) also implicated the temporal regions of the brain with violence.

Like intelligence, memory function is not a unitary process, but represents the sum performance of many specific skills that are normally highly interrelated (Berg, 1987). In evaluating memory, one looks at several factors: the general level at which the individual functions, a

comparison of that level with other general skills such as intelligence, and additional memory skills (e.g., Digit Span). Overall, memory levels are rarely significantly better than intellectual levels, as intelligence serves as a limiting factor to memory performance. This is supported by group 2 scoring significantly higher on the vocabulary component and the total score on the Shipley, while group 1 had the lowest mean scores among the four groups.

Groups 1 and 3 scored higher than the other two groups on the HVOT. Lezak (1982) found no significant correlation with sex, education, age (with the exception of old age), or intelligence (except at borderline defective and lower levels). The face validity of the test lies in its demand on perceptual differentiation and conceptual organization (including mental rotation) of the fragmented objects. This is an interesting relationship; one might speculate that groups 1 and 3 excel in the area of conceptual organization, but this is not supported by their earning the lowest mean scores on Shipley Abstract, which also assesses conceptual organization. The Shipley, however, assesses verbal conceptual organization (Berg, et al.) while the HVOT assesses nonverbal conceptual organization. Perhaps groups 1 and 3 have learned to compensate for verbal weaknesses.

Group 2 scored significantly higher than all other groups on Digit Span, which measures immediate auditory memory or attentional capacity. Group 2's performance

suggests that they might have a left hemisphere advantage over the other three groups. Digit Span is also influenced by emotional factors such as anxiety (Golden, et al.). Results of personality testing, discussed below, suggest that group 2 experiences less psychological distress and utilizes a calmer approach to situations, which may aid in further explaining their ability to better attend to a task such as Digit Span.

To accurately interpret Finger Tapping results one must keep in mind the contralateral innervation of the motor system, and the fact that there is considerable variability in the normal population, with the preferred hand not always the faster one (Bornstein, 1985). Group 1 scored lower on FTNON than all other groups. Typically, the performances of the dominant and nondominant hands are compared, with the dominant hand usually performing about 10% better than the nondominant hand (Reitan & Wolfson, 1985). Group 1's performance should not necessarily be considered as an indication that the motor area of the contralateral hemisphere functions better, however, as they received the lowest mean score on FTDOM. Their performance may have been affected by working under time pressure when doing tests that require motor speed and kinesthetic ability. Group 2 scored higher on FTNON than all other groups, and groups 2 and 4 scored higher on FTDOM than both groups 1 and 3. It would appear that the motor areas in group 2's hemispheres

function equally well and that the motor area of group 4 subjects' contralateral hemisphere is superior.

Group 3 scored lower on Digit Symbol, than all other groups. This subtest measures a variety of factors including motor speed, attention, psychomotor efficiency, and visual-motor coordination. A deficit in attending is supported by this group's scores on Digit Span. Digit Symbol calls upon functions of the left hemisphere when dealing with symbols and on the right hemisphere for drawing shapes. Group 3's scores indicate that both left and right hemispheres functioned less effectively on this task. Additionally, group 3 may have been influenced by the time element.

Groups 2 and 4 scored higher than groups 1 and 3 on SHIPVOC and SHIPTOT. The Vocabulary subtest primarily assesses basic verbal skills. Specific factors include acquired knowledge, long-term memory, verbal comprehension, concept formation and reading ability, which reflect crystallized intelligence. The skills measured by Abstraction more closely approximate fluid intelligence tasks. In interpreting the summary scores there are four mutually exclusive possibilities. Individuals can score below average on both subtests, score average or above average on both subtests, score high on one subtest or low on the other or vice versa. The results of the present study suggest that groups 2 and 4 have better vocabulary

skills and higher general verbal intelligence than groups 1 and 3. It is certainly conceivable that the ability to contemplate and plan a crime, to consider and attempt to avoid consequences, would be skills that might be less difficult for groups 2 and 4 than groups 1 and 3.

Analysis of Variance identified race as distinguishing between group 2 and all other groups. These results should be interpreted with caution. Group 2 is not equally represented by race within this sample, as the majority of incarcerated nonviolent sex offenders are White. This phenomena generates several hypotheses. First, White males may actually engage in nonviolent sex offenses more than Black males. Secondly, nonviolent sex offenses perpetrated by White males are reported more frequently than offenses by Black males. Coincidental with this is the possibility that when nonviolent sex offenses occur within Black families, other resources (e.g., friends, clergy) are sought to resolve such problems as opposed to contacting the police and pursuing legal action.

Numerous studies have demonstrated that as early as three and four years of age, boys are cognizant of what constitutes masculine behavior (Greene, 1992). For Black men, male gender traits are augmented by racial implications. The psychohistory of Black men is replete with struggles to exercise control over their own lives (Franklin, 1992). Their historical and personal experiences

influence their perceptions of how they will be treated by society and how societal rules and codes may be applied to them. The sensitivity of many Black persons to the potential for exploitation by White persons has been referred to as cultural paranoia (Grier and Cobbs, 1968). To say that part of this paranoia has to do with the Black male's fear of how he will be treated by law enforcement officials is probably an understatement.

Faulkner (1983) uses the term "armoring" to describe behavioral and cognitive skills used by Blacks, as well as other persons of color, to decrease their psychological vulnerability in encounters with racism. Members of the Black race have used a variety of strategies to cope with racism. According to Stevenson and Rehard (1993), key domains of Black family strengths include the dependence on extended family relations, influence of a religious worldview, and family communication about surviving racism. This role of extended kinship patterns and flexibility in caretaking roles, in conjunction with cultural paranoia, could explain the underreporting of certain offenses that are considered particularly taboo.

Further analysis identified race as a factor with White subjects scoring higher on LMII, VRI, VRII, and SHIPVOC. If memory and intelligence are correlated, these results suggest that the White subjects in this study function at a higher intellectual level than the Black subjects. Black

subjects scored higher on the HVOT indicating that they may perform better on nonverbal, as opposed to verbal tasks involving conceptual organization.

Personality testing revealed that group 1 scored higher on Scale F than all other groups, and group 2 scored lower. The F scale consists of 60 items that were selected to detect unusual or atypical ways of answering the test items. The scale attempts to assess a variety of obvious and unambiguous content areas, including bizarre sensations, strange thoughts, peculiar experiences, feelings of isolation and alienation, and unlikely or contradictory beliefs, expectations, and self-descriptions (Dahlstrom, 1972). The mean score for group one was 60.444. Scores within the range of 56-64 may indicate normal persons who are slightly more conforming than usual or those who have a tendency to resort to denial mechanisms. The mean score for group two was 50.111. Scores within the range of 45-55 suggest that these individuals may be sophisticated persons who are attempting to create a favorable self-image (Greene, 1991). Elevation of the F scale provides an index of the psychological distress that the individual is experiencing and is positively correlated with the overall elevation of the entire clinical portion of the profile and particularly Scales 6 (Paranoia) and 8 (Schizophrenia). Subjects evaluated in forensic settings generally have, or perceive themselves as having, tangible gains either from

accentuating their strengths or weaknesses. In comparison to the normal population, minimization is far more common among sex offenders than exaggeration (Grossman, Haywood, & Wasyliv, 1992).

Group 2 also scored significantly lower on Scale 9 (Mania) with a mean group score of 50.333 placing them in the normal range. The remaining three groups scored in the moderate range (58-64), suggesting they tend to be more active, outgoing, and energetic but also more rebellious (Greene, 1991). External restrictions may result in agitation and overtly expressed dissatisfaction. By contrast, nonviolent sex offenders tend to be more inhibited. There is little chance of their becoming agitated and resorting to acting out behavior should they be rejected (Panton). When one considers that nonviolent offenders are usually well-known by their victims and that their relationship is established over time, it is not surprising that the nonviolent sex offenders would not display excitability or be overly sociable, as this might draw attention to their activities. Maintaining a "low profile" is tantamount to their success.

Stepwise Discriminant Analysis identified the F scale, discussed above, and Scale 6 as significant contributors. Interpersonal sensitivity, moral self-righteousness, and suspiciousness are revealed by the items that comprise this scale. The subjects participating in the present study fall

within the normal (45-57) to moderate range (58-64), suggesting a certain amount of suspiciousness and a tendency to personalize the actions of others toward them. This suspiciousness was evident in many of the interviews conducted prior to testing, but such behavior is not uncharacteristic of incarcerated felons. This population is typically elevated on other clinical scales, specifically Scale 4, often seen in conjunction with Scale 9. These individuals tend to be overactive, impulsive, irresponsible, untrustworthy, and exhibit a tendency to get into trouble (Greene, 1991). This configuration is common among those with delinquency, repeated crimes of indecent exposure (McCreary, 1975), and sex offenders (Erickson, Luxenberg, Walbek, & Seely, 1987; Hall, Mauro, Vitaliano, & Proctor, 1986). The significance of Scale 6 may reflect a cautious approach that may be characteristic of the sample being studied, and that may have prevented additional scales from being elevated, although it does not appear to have affected the validity scales.

In summary, group 1 rendered scores significantly lower than the other three groups on two measures that are sensitive to left hemisphere impairment (SHIPVOC & SHIPTOT) and one that assesses right hemisphere impairment (VRI), suggesting a more diffuse, rather than a lateralized mode of functioning. This is supported by their scoring higher than groups 2 and 4 on the HVOT, a test not found to be

correlated to intelligence and one which performance is not affected by either right frontal or left-hemisphere lesions. Group 2 demonstrated significantly higher scores on two measures that involve left hemisphere functioning (SHIPVOC & SHIPTOT), supported by a significantly better performance on DIGSPAN, indicative of a lack of left hemisphere impairment. This group's scores on VRII suggest a right hemisphere advantage, while their performance on tests of fine motor speed (FTDOM, FTNON) indicates that both hemispheres probably function equally well. On the WAIS-R subtest that is most sensitive to cerebral damage (DIGSYM), group 3 scored lower than all other groups. They also scored lower on SHIPVOC and SHIPTOT but generally the data do not support the presence of cerebral damage. Group 4 shared significant results with group 2 on SHIPVOC & SHIPTOT which may indicate an ability to better process information with the left as opposed to the right hemisphere.

Implications for Future Research

As WAIS-R Digits Forward and Digits Backward do not involve identical operations, further analysis that examines them as separate scores as opposed to a combined total score is suggested.

The issue of race as a variable in terms of group distribution is perplexing. It is possible that the hypotheses generated above in reference to group 2 being significantly more populated by white subjects are correct.

An alternative may be how systems react to offenders based upon race. A survey tapping several institutions (e.g., the courts, social services, schools) may shed some light on this situation.

Harris & Lingoes (1955) developed three subscales within Scale six: Persecutory Ideas, Poignancy, and Naivete; and four subscales within Scale 9: Amorality, Psychomotor Acceleration, Imperturbability, and Ego Inflation. Evaluation of the data with these subscales might provide further insight regarding differences among the four groups.

While the "cycle of violence" hypothesis supports the notion that abused and neglected children have a higher likelihood of subsequent criminal behavior (Widom, 1989; Koss & Dinero, 1988), the antecedents of violent crime may include childhood victimization, head injuries, and alcohol and drug abuse. A longitudinal study focusing on documented cases of all of the above variables is indicated.

Legitimization of violence theory suggests that most victims of crime are known to their perpetrators. Determining the nature of the relationships in future studies of this type would assist in shedding additional light on the finding herein. Additionally, Brown & Strauss (1988) reported that legitimate violence is more prevalent in states that have a disproportionate number of divorced and single men. Marital status was not included in the

demographic data that was collected for this research but should be considered in future studies.

Finally, this project was originally designed to include adolescent sex offenders. While it is widely accepted that "most" sex offenders were sexually abused as juveniles, little attention has been paid to the study of adult offenders with juvenile histories as perpetrators. To surmise that sexual assault through the life span does not exist is naive. Future research should address this issue. Additionally, the propensity to be involved in situations that might result in head injury (e.g., motor vehicle accidents) as well as indulging in substance abuse is usually often higher during late adolescence. Evaluation of offenders between the ages of 12 and 18 would assist in determining if there are neuropsychological differences that exist beyond the scope of what has been presented in the research thus far.

Implications for Treatment

Sex offenders are unique in that they have committed a crime, but may be perceived as requiring treatment as opposed to incarceration. Courts often order a sex offender into treatment without evaluation by a mental health professional. Thus, sex offenders presenting for treatment may be in active denial and very poorly motivated to engage, or progress, in treatment. They may participate due to the extrinsic motivation of a prison sentence that has been

suspended or the possibility of parole, but the intrinsic motivation to actually engage with the treatment program is often lacking.

Treating sex offenders in a prison environment is fraught with pros and cons. While the therapist has a captive audience, and need not be concerned about canceled appointments, this group has already been adjudicated, convicted, and incarcerated. It is often difficult for inmates to become invested in therapy when it doesn't provide an option to their not going to prison or ensure their parole. Theoretically, the ideal intervention involves support from family members. It is often difficult for the therapist treating sex offenders in a prison setting to meet with the offender's family given the traveling time required to visit many prison facilities. This is compounded by the likelihood of many offenders being members of dysfunctional families who have no interest in a family approach to rehabilitation. Abused and neglected children have a higher likelihood of arrest for delinquency, adult criminality, and violent criminal behavior (Widom, 1989). According to Schroeder (1989), criminal behavior is most commonly concentrated in inner-city areas where the family structure is most greatly fragmented. In a study released in 1988 by the Department of Justice, researchers found that of the juveniles in state-operated institutions in 1987, only about 30% had lived with both parents while growing up.

Fifty-four percent had lived in single-parent household, while another 16% lived with grandparents or in some other arrangement without both parents.

The topography of sex offenders indicates that most violent offenders range in age from adolescence through early thirties and usually begin their criminal careers at the lower end of the age spectrum. They usually have a varied criminal background, including such crimes as break and enter, theft, and physical assault (Baxter, D.J., Marshall, W.L., Barbaree, H.E., Davidson, P.R., & Malcom, P.B., 1984). According to the authors, violent sex offenders have been classified in a variety of ways, most of which focus on the primary motivations for raping, but seem to fall within one of the following categories. For one group, the sexual offense results from poor impulse control, and the offense is one of many instances of unsocialized behaviors with the perpetrator being indifferent to the trauma experienced by their victims. The second group is comprised of the pervasively angry rapist who often inflicts serious victim injury. Their anger is generalized, independent of sexual arousal or motivation and not restricted to women. A third group is comprised of rapists whose anger is focused exclusively on women. Their assaults are characterized by verbal abuse and physical violence, usually result in harm, and often the degradation and humiliation of the victim.

Nonviolent sex offenders are more likely to be older than rapists. They do not demonstrate the same diversity of nonsexual offenses in their criminal history and they are not likely to have begun their criminal career as early as the violent sex offenders (Baxter, et al). Nonviolent sex offenders tend to fall into one of two categories: interpersonal or narcissistic. Interpersonal contact indicates that the relationship between the offender and victim occurs over a broad range of activities, not restricted to sexual interactions, and that the primary goal of sexual contact is not necessarily orgasm. Narcissistic contact is primarily sexual and directed toward orgasm (Knight, R.A. & Prentky, R.A., 1990).

The goals of a program designed to successfully treat sex offenders should include the offender assuming full responsibility for the sexually abusive behavior, acquiring insight regarding the behavioral patterns that led to the crime and, perhaps most importantly, decreasing recidivism. This study indicates that there is a difference between violent and nonviolent sex offenders. Hopefully, this finding can help the therapist think strategically about intervention. For example, violent sex offenders' scores on SHIPVOC and SHIPTOT are indicative of lower left hemisphere functioning; their performance on VRI suggests lower right hemisphere functioning. Higher HVOT scores support the notion that neither the left nor right

hemisphere dominates. Treatment modalities that focus on verbal skills and behavior change through education will probably not be successful with this group. Based upon test results, behavioral techniques are recommended.

Assertiveness training can be useful in treating violent sex offenders who may lack skills to express both positive and negative feelings and to differentiate between aggression and assertiveness. These deficits make it difficult for them to establish and maintain a social relationship which might lead to an appropriate bond with another individual. Primary aspects of assertiveness training include expressing one's ideas more clearly, reducing anger, and controlling impulsive behavior. Employing techniques such as modeling, graded task assignments, and role playing, ideally with videotaped feedback, are behavioral methods that might be successful with this group. A group setting can be particularly useful for assertiveness training.

Internal locus of control, operationally defined as one's experience of who/what has control over his life, is another useful technique with violent sex offenders. They attempt to restructure their own experiences of their ability to make choices and positively control aspects of their lives. These proactive choices become part of their experiential storage reservoir. As they become more personally powerful, the ego strength required to examine

their crimes and assume responsibility develops. Social skills training, behavioral rehearsal, and relaxation exercises are other techniques that might prove beneficial.

Sex education is an important aspect of any offender treatment program. For this group, emphasis should be placed on commonly held sexual myths, including the pattern of sexual arousal and appropriate sexual communication. To accomplish this, listening to sexually arousing tapes until satiation occurs and arousal decreases has been used in some settings.

Nonviolent sex offenders scored higher on SHIPVOC, SHIPTOT, and DIGSPAN, functions of the left hemisphere. Their performance on VRI suggests a right hemisphere advantage. Higher scores on FTDOM and FTNON support both hemispheres functioning well, although the left hemisphere seems to be slightly superior to the right. Because they seem to be somewhat higher functioning, a cognitively oriented approach is recommended for this group.

The approach used in Cognitive Therapy has been described as "collaborative empiricism" (Beck, Rush, Shaw, & Emery, 1979). The therapist attempts to assist the individual in helping him or her recognize the cognitions and other factors that cause problems, to test the validity of the thoughts, beliefs, and assumptions that prove important, and to make the needed changes in cognition.

The majority of these individuals have offended in a

manner that is particularly insensitive to the morals and ethics of our society. When there is a discrepancy between that which has been done and society's belief about appropriate behavior, dissonance is created which leads to considerable anxiety, guilt, and depression. To avoid these emotions, most offenders develop cognitive distortions that support their continued involvement in deviant sexual activities, therefore, cognitive restructuring is recommended as the first phase. This element of treatment is designed to explore the validity of each perpetrator's cognitive beliefs that justify the violation. It is realized that this phase of treatment is extremely difficult, for it is this super structure of distorted beliefs that allowed the offender to engage in his behavior. Guided Association/Guided Discovery and thought stopping are two additional techniques appropriate for this group.

Given the nature of many of the nonviolent offenses, empathy is included as a phase. The offender attempts to acquire sufficient insight to facilitate understanding the feelings, thoughts, and trauma their victim(s) experienced as a result of the abuse. The victims participating in the treatment process is especially salient if he or she is a family member.

Sex education is also a component for the nonviolent sex offenders with emphasis on what is accepted as normal sexual behavior and where each offender fits along that

continuum. Sexual dysfunctions should also be addressed.

Relapse prevention techniques are applicable to both groups. The goal is to ensure that the offenders have assimilated the information provided and possess the skills for utilizing the information to prevent re-offending. Specific areas of weakness should be targeted on an individual basis and a determination is made regarding each offender's "readiness" for discharge from the program.

The question of the uniqueness of sexual offenders as compared to other criminals and of the need for special statutes and programs for sexual offenders have been prominent in forensic settings. The results of the present study support the concept that violent sex offenders differ from nonviolent sex offenders in terms of neuropsychological functioning; violent sex offenders utilize a diffuse rather than a lateralized mode of processing information and nonviolent sex offenders have a slight left hemisphere advantage and are somewhat higher functioning. Differences between the two groups were also found on two of the MMPI-2 scales and, combined with the neuropsychological data, suggest that violent and nonviolent sex offenders represent two distinct clinical groups.

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Table 1Demographic Data by Group

Group	<u>1 (n=23)</u>	<u>2 (n=18)</u>	<u>3 (n=24)</u>	<u>4 (n=23)</u>
<hr/>				
Age				
Mean	32.000	34.111	29.292	32.217
SD	7.230	8.123	6.231	7.754
Education				
Mean	11.565	12.722	12.292	11.913
SD	1.534	1.745	2.350	1.857
% by Race				
Black	60.870	16.667	58.333	60.870
White	39.130	83.333	41.667	39.130

Table 2Mean T-Scores for Demographic and Neuropsychological Data
by Group

Group	<u>1(n=23)</u>	<u>2(n=18)</u>	<u>3(n=24)</u>	<u>4(n=23)</u>
Age (yrs.)	50.300	49.822	50.092	49.117
Education (yrs.)	50.617	50.023	50.683	54.696
Race	52.674	50.775	49.833	52.391
Laterality				
Hand	52.243	56.222	49.488	49.452
Foot	49.452	49.700	49.488	49.422
Arm	49.452	49.700	49.488	49.452
Eye	48.948	47.600	49.725	52.922
LMII	41.304	48.167	42.458	46.478
VRI	46.391	52.389	48.333	50.304
VRII	46.391	53.889	46.750	48.609
HVOT	50.870	46.611	51.833	47.174
SHIPVOC	39.391	49.389	41.542	43.696
DIGSYM	42.348	48.944	40.500	44.522
LMI	43.391	46.333	42.583	46.905
SHIPABS	46.696	52.824	48.870	50.957
SHIPTOT	42.304	51.588	44.870	49.478
TRAILS A	45.391	43.222	44.652	47.783

(table continues)

TRAILS B	47.217	47.667	43.826	47.130
FTDOM	39.174	51.833	40.522	46.696
FTNON	43.043	51.778	44.826	47.913
DIGSPAN	41.565	52.056	44.957	48.000
COWA	49.000	52.333	48.458	52.909

Table 3
Grouping by Race

<u>Variable</u>	<u>5=Black</u>	<u>6=White</u>	<u>Race</u>
	<u>Mean</u>	<u>N</u>	
LMII	45.909	44	6
	42.841	44	5
VRI	50.591	44	6
	46.614	44	5
HOOPER	51.136	44	5
	47.455	44	6
SHIPVOC	48.295	44	6
	38.000	44	5
DIGSYM	44.591	44	6
	42.932	44	5

Table 4
Stepwise Discriminant Analysis Summary for
Neuropsychological Variables

Variable Entered	<u>FTDOM</u>	<u>LMII</u>	<u>HAND</u>	<u>TRAILS A</u>
Partial R**2	0.302	0.207	0.075	0.689
F Statistic	11.101	6.597	2.038	1.825
Pr>F	.000	.000	.116	.150
Wilks' Lambda	.698	.554	.512	.477
Pr<Lambda	.000	.000	.000	.000
Average Squared	.101	.150	.166	.179
Canonical Corr.				
Pr>ASCC	.000	.000	.000	.000

Table 5MMPI-2 Mean T-Scores for Dependent Variables

Scales

L	55.097
F	55.170
K	48.390
HS	51.341
D	51.463
HY	48.512
PD	62.243
MF	48.097
PA	54.219
PT	52.121
SC	55.024
MA	58.609
SI	49.365

Table 6Student-Newman-Keuls Grouping for Scales F & 9

<u>Variable</u>		<u>Group</u>	<u>Mean</u>	<u>N</u>
Scale F	A	1	60.444	9
		A		
	B	A	56.692	13
		A		
	B	A	53.000	10
		B		
	B	2	50.111	9
Scale 9	A	1	62.222	9
		A		
		A	61.462	13
		A		
	B	A	59.100	10
		B		
	B	2	50.333	9

Table 7Stepwise Discriminant Analysis Summary for MMPI-2

Variable Entered	<u>MA</u>	<u>PA</u>	<u>F</u>	
Variable Removed				<u>MA</u>
Partial R**2	0.192	0.120	0.148	0.129
F Statistic	2.293	2.993	2.027	1.725
Pr>F	0.463	0.435	0.128	0.180
Wilk's Lambda	0.808	0.647	0.551	0.632
Pr<Lambda	0.046	0.132	0.010	0.009
Average Squared	0.064	0.127	0.167	0.134
Canonical Corr.				
Pr>ASCC	0.463	0.013	0.013	0.009

Appendix A
Measures

Examiner:
Name:
Location:
D.O.B.:
Education:

Date:
Code:
Race:
Age:
Handedness:

1. Do you...

- wear glasses
 wear contact lenses

Examiner's Comments

- Have you had...
 blurred vision
 double vision

2. Test for peripheral vision...

1. ___ 2. ___ 3. ___

3. Do you have...

- decreased hearing in the
left ear
 decreased hearing in the
right ear
 decreased hearing in both
ears

4. Do you have...

- pain or numbness in your right
fingers, hand, or arm
 pain or numbness in your left
fingers, hand, or arm

5. Do you have...

- pain
 headaches

6. Have you had...

- black-out spells
 fits or seizures

7. Have you had...

- head injuries
 a stroke
 a brain tumor
 treatment for substance abuse
 injury to the hands or arms

8. Do you...

- drink alcohol
If yes, how much?
 Use street drugs...
If yes, which ones?

- take prescribed or over-the-counter medications
If yes, which ones?
- work with chemicals
If yes, which ones?

9. Test for laterality...
- L/R kick a ball
 - L/R throw a ball
 - L/R telescope

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Appendix B
Analyses of Variance

Analysis of Variance

SOURCE	SS	df	MS	F	Pr>F
<u>Age</u>					
MODEL	251.850	3	83.950	1.37	0.259
ERROR	5164.649	84	61.483		
<u>Race</u>					
MODEL	2.536	3	0.845		
ERROR	19.463	84	0.231	3.65*	0.015
<u>Education</u>					
MODEL	15.225	3	5.075	1.08	0.363
ERROR	396.047	84	4.714		
<u>Hand Laterality</u>					
MODEL	0.475	3	0.158	.07	0.528
ERROR	17.888	84	0.212		
<u>Foot Laterality</u>					
MODEL	1.765	3	0.588	1.18	0.324
ERROR	42.053	84	0.500		
<u>Arm Laterality</u>					
MODEL	0.712	3	0.237	1.80	0.152
ERROR	11.059	84	0.131		

(table continues)

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Pr>F</u>
<u>Eye Laterality</u>					
MODEL	43.852	3	14.617	0.83	0.480
ERROR	1478.511	84	17.601		
<u>LMII</u>					
SOURCE	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>PR>F</u>
MODEL	665.557	3	221.852	4.95*	0.003
ERROR	3763.067	84	44.798		
<u>VRI</u>					
MODEL	569.513	3	189.837	3.50*	0.019
ERROR	4555.350	84	54.230		
<u>VRII</u>					
MODEL	697.845	3	232.615	3.70*	0.148
ERROR	5277.234	84	62.824		
<u>HVOT</u>					
MODEL	444.794	3	148.264	5.27*	0.148
ERROR	2363.524	84	28.137		
<u>SHIPVOC</u>					
MODEL	1094.495	3	364.831	3.27*	0.002
ERROR	9360.583	84	111.435		

(table continues)

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Pr>f</u>
<u>DIGIT SYMBOL</u>					
MODEL	798.087	3	266.029	2.68*	0.521
ERROR	8339.900	84	99.284		
<u>LMI</u>					
MODEL	296.704	3	98.901	1.76	0.161
ERROR	4609.121	82	56.208		
<u>SHIPABS</u>					
MODEL	425.187	3	141.729	1.80	0.152
ERROR	6438.905	82	78.523		
<u>SHIPTOT</u>					
MODEL	1105.037	3	368.345	5.19*	0.002
ERROR	5819.335	84	70.967		
<u>Trails A</u>					
MODEL	228.762	3	76.254	0.63	0.595
ERROR	9991.719	83	120.382		
<u>Trails B</u>					
MODEL	208.886	3	69.628	0.58	0.629
ERROR	9943.826	83	119.805		
<u>FTDOM</u>					
MODEL	2083.931	3	694.643	7.76*	0.000
ERROR	7426.413	83	89.474		

(table continues)

Source	<u>SS</u>	<u>df</u>	<u>FTNON MS</u>	<u>F</u>	<u>Pr>F</u>
MODEL	885.514	3	295.171	3.13*	0.030
ERROR	7835.198	83	94.399		
<u>DIGSPAN</u>					
MODEL	1219.780	3	406.593	5.70*	0.001
ERROR	5919.553	83	71.319		
<u>COWA</u>					
MODEL	339.901	3	113.300	1.75	0.162
ERROR	5367.776	83	64.672		

MMPI-2 Analysis of Variance

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>PP>F</u>
<u>L</u>					
Model	41.431	3	13.810	0.12	0.948
Error	4308.177	37	116.437		
<u>F</u>					
Model	557.924	3	185.974	2.64*	0.063
Error	2607.880	37	70.483		
<u>K</u>					
Model	176.948	3	58.982	0.57	0.635
Error	3796.807	37	102.616		
<u>HS</u>					
Model	61.871	3	20.628	0.15	0.926
Error	4939.347	37	133.495		
<u>D</u>					
Model	91.408	3	30.469	0.35	0.790
Error	3224.786	37	87.156		
<u>HY</u>					
Model	35.235	3	11.745	0.09	0.963
Error	4603.008	37	124.405		

(table continues)

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>PR>F</u>
<u>PD</u>					
Model	204.182	3	68.060	0.77	0.516
Error	3255.378	37	87.983		
<u>ME</u>					
Model	101.654	3	33.884	0.37	0.773
Error	3361.955	37	90.863		
<u>PA</u>					
Model	1021.847	3	340.615	2.45	0.079
Error	5153.176	37	139.279		
<u>PT</u>					
Model	3392.792	3	68.199	0.74	0.533
Error	204.597	37	91.724		
<u>SC</u>					
Model	309.464	3	103.155	1.21	0.317
Error	3141.511	37	84.906		
<u>MA</u>					
Model	842.069	3	280.689	2.93*	0.046
Error	3545.686	37	95.829		
<u>SI</u>					
Model	304.103	3	101.367	1.13	0.350
Error	3323.408	37	89.821		

Pamela Knox-Jones was born in New York City, New York and raised in Teaneck, New Jersey. She attended Howard University, majoring in anthropology, before moving to the Tidewater area. She completed requirements for a bachelor's degree in Special Education at Norfolk State University in 1976 and a master's degree in psychology at Old Dominion University in 1982. She taught mentally retarded and learning disabled students in the Norfolk School system from 1976-1984. She was the Chief Psychologist at St. Bride's Correctional Center in Chesapeake, Virginia from 1984-1989, at which time she accepted the position of Court Psychologist, Hampton Juvenile and Domestic Relations Court, Hampton, Virginia. She maintained this position until 1991 when she pursued studies at the Virginia Consortium for Professional Psychology. She is the Past President of the Virginia Association of Correctional Psychologists, and the Current Membership Chair of the Virginia Applied Psychology Association. She was the recipient of a Letter of Commendation from the Norfolk Public Schools (1977); a University Fellowship, Old Dominion University (1982) and the Black American Research Assistantship, Old Dominion University, 1991. She was also appointed to The Promising Administrator's Corp, Virginia Department of Corrections, (1986).