Commentary: Sex and Violence

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Dr. Lewis and her colleagues have presented a theory concerning the origin of violent behavior. Their thesis is that the tendency to commit violent crimes is the result of the interaction of severe abuse in childhood (physical and/or sexual) with neurologic disturbances and mental illness, especially paranoia and mood disorder. According to the theory, abuse generates violent urges, and neurologic and mental diseases of the brain damage the capacity to check the violent urges.

To present six adopted young men who became murderers, Dr. Lewis and her colleagues had to perform the exacting and arduous task of obtaining complete medical histories and family histories of their biological and adoptive families. The findings strongly support her theory: Five of her six subjects had been exposed to violence in their adoptive homes, had at least one psychotic biological parent, and had sustained neurologic damage, mostly from antenatal and perinatal sources.

This report raises questions about the hereditary nature of mental illness, violent behavior, and the gender difference; all six of Dr. Lewis's subjects were boys. If mental illness and the tendency to become a violent criminal are influenced by hereditary factors, there may be great risks in adoption.

Approximately twice as many adopted adolescents in this country have received mental health counseling as their nonadopted peers.[1] Similar findings emerged from The Netherlands, where 22 percent of adopted boys and 18 percent of adopted girls could be regarded as deviant, compared with approximately 10 percent of the subjects in the general population.[2] These studies suggest that although most adopted children are not deviant, there is twice as much mental deviance in adopted children.

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Adoption studies have been used for several decades to determine the role of genetic factors in several serious mental conditions. Conversely, they illuminate some possible consequences of adoption. These include schizophrenia, bipolar affective disorder, unipolar depression, suicide attempts, alcoholism and drug dependency, and criminality. These studies have provided strong evidence that some of these conditions have strong genetic components.

Tienari *et al.*[3] showed that there is a genetic liability to schizophrenia, schizoaffective disorder, schizophreniform, schizotypal disorders, and affective psychoses. Kety,[4] working in Denmark, also showed that chronic schizophrenia and milder and marginal syndromes resembling schizophrenia (latent, borderline, or uncertain schizophrenia) concentrate significantly in the biological relatives of schizophrenic adoptees, compared with control subjects. In an expanded study, Kety *et al.*[5] found that severe, chronic schizophrenia or latent schizophrenia occurred in 13 percent of the biological relatives of adopted schizophrenics. This indicated that familial clustering in schizophrenia is an expression of shared genetic factors, although most of the first-degree relatives of persons with schizophrenia have neither schizophrenia nor latent schizophrenia.

Family, twin, and adoption studies have provided strong evidence that bipolar affective disorder is also genetic. So strong is the clinical evidence that the recent literature has moved away from clinical adoption studies, detailing the so far unsuccessful efforts to identify the chromosome and gene responsible for it. This has been the subject of several recent reviews.[6,7] The approximate lifetime risk of bipolar disorder in a monozygotic co-twin is 40 to 70 percent, 5 to 10 percent in first-degree relatives, and 0.5 to 1.5 percent in unrelated persons.[8]

There is evidence that severe, recurrent unipolar depression is also familial and is a disease that is separate from bipolar affective disorder. There is an

eightfold increase in unipolar depression and a 15-fold increase in suicide among the biological relatives of index cases.[9] To determine whether suicide attempts were related to adoption, a recent study of representative U.S. adolescents, 213 of whom were living with their adoptive mothers and 6,363 of whom were living with biological mothers found that 7.6 percent of adoptees and 3.1 percent of control subjects attempted suicide.[10] Attempted suicide in both adopted and nonadopted children was significantly associated with several other variables, including depression, delinquency, and aggression.

Alcoholism and drug abuse have certain genetic determinants, but this evidence is not clear cut. Gender, the severity of alcohol and/or drug abuse, and the presence of depression makes a big difference in some studies.[11–14] In the opinion of this writer, no gene for alcoholism will ever be found. In societies that sanction the use of alcohol in times of trouble, the perception of trouble is associated with alcoholism; hence, the association of drinking with mood disorder in Western countries. From this brief review, it seems incumbent on any physician or adoption agency to determine whether the biological parents of prospective adoptees have a mental disorder that might be genetic and to inform the adoptive parents accordingly.

The theory that an abnormal gene causes human violent criminal behavior has been definitively contradicted by clinical adoption studies. The criminal histories of adopted males were compared with the criminal histories of both their biological and adoptive fathers. These studies found that genetic influences did not cause violent crime, although there were genetic influences in nonviolent, petty crimes.[15,16]

An understanding of violent crime requires a model that accounts for the interaction of the various components that lead to it. Cadoret *et al.*[17] produced evidence that a genetic-environmental interaction gives rise to violence. Raine *et al.*[18] indicated that brain damage and abuse together lead to violent crime more than either one alone or the sum of both. Clearly, Dr. Lewis's theory has support. Her findings in this study show that an abusive, adoptive home, combined with neurologic damage and a hereditary tendency to mental illness created a devil's brew with respect to violent acts in six adopted boys.

One of the enduring puzzles in the study of human violence has been the effect of gender. Although it would be an overstatement to say that women are not violent, it is also true that men commit violent crimes such as homicide more frequently than women by margins of approximately nine to one. Men commit 93 to 98 percent of gang-related, drug-related, and sex-related felony murder.[19]

The nearly exclusive focus of whatever violence is committed by women lies within a family relationship.[19] Women commit 37 percent of all homicides of intimates and 39 percent of infanticides. Women, mothers and stepmothers primarily, are responsible for 61 percent of the cases of the physical abuse of children.[19,20] If Dr. Lewis's theory about the interaction of three factors that produce a vulnerability to violence is correct, we must look at the distribution of these factors in groups that are more likely to be violent—in this case, males.

Boys and girls are near parity with regard to the prevalence of abuse and mental illness, but neurologic damage is much more common in boys. Forty-eight percent of physical abuse victims are girls, as are 77 percent of reported sexual abuse victims.[20] Conceivably, sexual abuse is more damaging to the psyches of boys than of girls. There is evidence of gender differences in the response to abuse. Garnefski and Diekstra[21] compared 745 high school students (151 boys and 594 girls) who reported a history of sexual abuse, with a matched group of students without such a history. A larger proportion of the sexually abused students reported emotional problems, aggressive/criminal behaviors, addiction-risk behaviors, and suicidal tendencies. Sexually abused boys had considerably more problems in each of these areas than sexually abused girls. The differences could not be attributed to the finding that the sexually abused boys were more likely to have been physically abused than the sexually abused girls. This study indicated that the aftermath of sexual abuse in boys is even worse than in girls.

The sexual abuse of children is not rare. A report from Sweden[22] of the prevalence of a history of sexual abuse in a representative sample of almost 2,000 teenagers attending secondary school indicated that 2.3 percent of boys and 7.1 percent of girls had been sexually abused. The mean age at the time of first abuse was nine years for both sexes; 1.2 percent of boys and 3.1 percent of girls reported penetration orally, vaginally, or anally. Suicide attempts or other acts of self-harm were reported by 33 percent of the abused boys (and 5% of the nonabused boys) and by

30 percent of the abused girls (9% of the nonabused girls). The sexual penetration of children is always likely to be painful and destructive to tissue, the more so because almost two thirds of the child victims in the United States are prepubertal (less than 11 years of age) and 39 percent are less than 7 years old.[20]

Boys are more likely to be seriously physically injured by physical abuse (nonsexual), as evidenced by the fact that 56 percent of the children killed by abuse are boys.[20] This is a meaningful gender difference but cannot explain the impressive difference between the sexes in the numbers of homicides committed by men and the almost exclusive focus of serious violence by women within a family relationship.[19,20]

If gender differences in the rates of child abuse do not explain the greater male propensity to violence, neither does the distribution of mental illness. The epidemiological facts concerning mental illness are inconsistent with the concept that males may be more violent because they have higher rates of mental diseases. The prevalences of serious mental illnesses that can cause paranoid delusions, such as schizophrenia and bipolar affective disorder, are approximately equally distributed by gender.[23] Schizophrenia starts a bit earlier in men and is generally somewhat more severe, probably because of a preexistent neurologic vulnerability.[24]

Males with schizophrenia consistently show poorer cognitive functioning than women, before becoming schizophrenic. Males also demonstrate more negative symptoms, such as withdrawal, apathy, and inability to relate to others. These negative symptoms do not respond well to antipsychotic drug treatment. Males with schizophrenia have more cognitive deficits, structural brain abnormalities, and neurophysiologic abnormalities. These facts suggest that there is more brain damage among males with schizophrenia.[24] Mania has about the same prevalence in both sexes.[25] Unipolar depression is actually 1.5 to 3 times more prevalent among women,[26] but the overall morbidity of mental illness is about the same for both genders in large population studies.[23]

In contrast, neurologic dysfunction is much more common among boys. Attention-deficit/hyperactivity disorder,[27] childhood autism,[28] pervasive developmental disorders,[29] dyslexia,[30] developmental dysphasia,[31] and certain forms of mental retardation are more prevalent among males by margins of up to four or five to one. These abnormalities may be inherited as such X-linked traits as the fragile X syndrome, a chromosomal abnormality that causes more cases of mental retardation than Trisomy 21 and affects only males.[32] Even normal boys demonstrate patterns of behavior that seem to reflect delayed brain development much more frequently than girls. The behavior of little girls in primary school is, in general, better modulated and more mature.

"Immaturity" and "as yet undeveloped" are related concepts, in that immaturity has a physiologic and anatomic basis. There is some preliminary evidence that the development of the circuitry of the brain is slower in boys than in girls.[33–35] This supports the old hypothesis that testosterone, the male hormone, impedes aspects of brain development and makes the male brain more vulnerable to a variety of learning and behavioral disorders[31] and to the kinds of unmodulated, careless motor activity that can result in traumatic brain injury, which is also much more common in boys.[36,37]

The unequal distribution of neurologic dysfunction between the sexes may account for much of the greater vulnerability of males to violence. The abnormal behavioral patterns imposed by neurologic deficits and delayed development can elicit severe parental responses, especially in abusive homes. In this way neurologic deficits can contribute to abuse and to the alienation of victims who, as a result of abuse, may tend to mistrust others (paranoia).

Supporting the link between abuse and neurologic damage is the fact that in developmentally disabled children, reported abuse is more common than in nondisabled children. In a population-based epidemiological study,[38] a strong link between neurologic, educationally relevant disability and abuse was discovered. Fully 31 percent of disabled children were abused, a rate 3.4 times greater than their nondisabled peers.

Not only are boys more likely to be disabled and not only does disability impose a greater risk of abuse, but boys with disability are demonstrably more likely than girls with disability to be abused. In a study of 1,834 abused children, disabled boys represented a significantly larger proportion of physically abused, sexually abused, and neglected children than would be expected from their respective proportion of abused and neglected children without disabilities; although half of abused children without disabilities were boys, 65 percent of abused children with disabilities were boys.[39]

The combination of neurologic defects with abuse and mental illness is several times more common in boys because neurologic defects are several times more common in boys. The abuse of damaged boys is more common than of damaged girls and is more harmful to the boys. These links between neurologic deficit and abuse adequately explains the increased prevalence of violence among males and these considerations also support the theory of Lewis and colleagues.

Abuse is humiliating and degrading and is likely to impose a sense of worthlessness, helplessness, anxiety, hopelessness, social incompetence, and guilt on children from which they can escape by being "bad" or by exerting the greatest effort throughout the remainder of their lives. The behavioral effects are noticeable and obvious in the primary school years.[40] A study of 665 children 9 to 17 years old revealed a history of abuse in 172. The investigators compared the abused with the nonabused children. Associated with the experience of physical abuse were global social impairment, poor social competence, major depression, agoraphobia, generalized anxiety, and conduct disorder and oppositional defiant disorder.[41]

To deal with the horrid feelings that abuse imposes, abused girls more than boys have a tendency to become sexually active at an early age,[22] to become promiscuous and/or prostitutes,[42] to bear children at an early age,[43] and to abuse the children. None of these behaviors is obligatory for abused girls, but there is evidence that such behavior is more likely in abused girls.

It seems probable that mothers would have greater access than fathers to the children with respect to the opportunity to abuse them[44]; hence, the violence of women is focused in the home. The options available to women for temporarily lifting their morale (attracting the opposite sex repeatedly in a short time, becoming pregnant, abusing their children) are not as available to men. Consequently, for men, the use of their physical size in conflicts with outsiders is a more likely outcome of the same destructive combination of factors that is the root of violence for both men and women: the interaction of abuse, mental illness, and neurologic damage.

References

1. Miller BC, Fan X, Grotevant HD, *et al*: Adopted adolescents' overrepresentation in mental health counseling: adoptees' problems or parents' lower threshold for referral? J Am Acad Child Adolesc Psychiatry 39:1504–11, 2000
2. Versluis-den Bieman HJ, Verhulst FC: Self-reported and parent-reported problems in adolescent international adoptees. J Child Psychol Psychiatry 36:1411–28, 1995
3. Tienari P, Wynne LC, Moring J, *et al*: Finnish adoptive family study: sample selection and adoptee DSM-III-R diagnoses. Acta Psychiatr Scand 101:413–5, 2000
4. Kety SS: The significance of genetic factors in the etiology of schizophrenia: results from the national study of adoptees in Denmark. J Psychiatr Res 21:423–9, 1987
5. Kety SS, Wender PH, Jacobsen B, *et al*: Mental illness in the biological and adoptive relatives of schizophrenic adoptees: replication of the Copenhagen Study in the rest of Denmark. Arch Gen Psychiatry 51:442–55, 1994
6. Potash JB, DePaulo JR Jr: Searching high and low: a review of the genetics of bipolar disorder. Bipolar Disord 2:8–26, 2000
7. Nurnberger JI, Foroud T: Genetics of bipolar affective disorder. Curr Psychiatry Rep 2:147–57, 2000
8. Craddock N, Jones I: Genetics of bipolar disorder. J Med Genet 36:585–94, 1999
9. Wender PH, Kety SS, Rosenthal D, *et al*: Psychiatric disorders in the biological and adoptive families of adopted individuals with affective disorders. Arch Gen Psychiatry 43:923–9, 1986
10. Slap G, Goodman E, Huang B: Adoption as a risk factor for attempted suicide during adolescence. Pediatrics 108:E30–7, 2001
11. Cadoret RJ, Yates WR, Troughton E, *et al*: Adoption study demonstrating two genetic pathways to drug abuse. Arch Gen Psychiatry 52:42–52 1995
12. Cadoret RJ, Winokur G, Langbehn D, *et al*: Depression spectrum disease. I: the role of gene-environment interaction. Am J Psychiatry 153:892–9, 1996
13. Cloninger CR, Bohman M, Sigvardsson, *et al*: Psychopathology in adopted-out children of alcoholics. The Stockholm Adoption Study. Recent Dev Alcholol 3:37–51, 1985
14. Yates WR, Cadoret RJ, Troughton E, *et al*: An adoption study of DSM-IIIR alcohol and drug dependence severity. Drug Alcohol Depend 41:9–15, 1996
15. Brennan PA, Mednick SA, Jacobsen B: Assessing the role of genetics in crime using adoption cohorts. Ciba Found Symp 194: 115–23, 1996
16. Mednick SA, Gabrielli WF Jr, Hutchings B: Genetic influences in criminal convictions: evidence from an adoption cohort. Science 224:891–94, 1984
17. Cadoret RJ, Yates WR, Troughton E: Genetic-environmental interaction in the genesis of aggressivity and conduct disorders. Arch Gen Psychiatry 52:916–24, 1995
18. Raine A, Brennan P, Mednick SA: Interaction between birth complications and early maternal rejection in predisposing individuals to adult violence: specificity to serious, early-onset violence. Am J Psychiatry 154:1265–71, 1997
19. Bureau of Justice Statistics Homicide: Trends in the United States 1976–1999, available at http://www.ojp.usdoj.gov:80/bjs/homicide/gender.htm
20. Child Maltreatment: Reports from the States to the National Child Abuse and Neglect Data System. Washington, DC: U.S. Department of Health and Human Services, pp 2–14, 1996
21. Garnefski N, Diekstra RF: Child sexual abuse and emotional and behavioral problems in adolescence: gender differences. J Am Acad Child Adolesc Psychiatry 36:323–9, 1997
22. Edgardh K, Ormstad K: Prevalence and characteristics of sexual abuse in a national sample of Swedish seventeen-year-old boys and girls. Acta Paediatr 89:310–9, 2000
23. Bijl RV, Ravelli A, van Zessen G: Prevalence of psychiatric disor-

der in the general population: results of The Netherlands Mental Health Survey and Incidence Study (NEMESIS). Soc Psychiatry Psychiatr Epidemiol 33:587–95, 1998
24. Leung A, Chue P. Sex differences in schizophrenia, a review of the literature. Acta Psychiatr Scand Suppl 401:3–38, 2000
25. Hendrick V, Altshuler LL, Gitlin MJ, Delrahim S, Hammen C: Gender and bipolar illness. J Clin Psychiatry. 61:393–7, 2000
26. Ustun TB: Cross-national epidemiology of depression and gender. J Gend Specif Med 3:54–8, 2000
27. Arnold LE: Sex differences in ADHD: conference summary. J Abnorm Child Psychol 24:555–69, 1996
28. Smalley SL, Asarnow RF, Spence MA: Autism and genetics. Arch Gen Psychiatry 45:953–61, 1988
29. Volkmar FR, Szatmari P, Sparrow SS: Sex differences in pervasive developmental disorders. J Autism Dev Disord 23:579–91, 1993
30. Flannery KA, Liederman J, Daly L, *et al*: Male prevalence for reading disability is found in a large sample of black and white children free from ascertainment bias. J Int Neuropsychol Soc 6:433–42, 2000
31. Rapin I, Allen DA: Syndromes in developmental dysphasia and adult aphasia. Assoc Res Nerv Ment Dis 66:57–75, 1988 (*see also*, Language Communication and the Brain. Edited by Fred Plum. New York: Raven Press, 1988)
32. Boue J, Simon-Bouy B: Genetics of fragile X syndrome and its prevention. J Gynecol Obstet Biol Reprod (Paris) 26:273–9, 1997
33. De Bellis MD, Keshavan MS, Beers SR, *et al*: Sex differences in brain maturation during childhood and adolescence. Cereb Cortex 11:552–7, 2001
34. Benes FM, Turtle M, Khan Y, Farol P: Myelination of a key relay zone in the hippocampal formation occurs in the human brain during childhood, adolescence, and adulthood. Arch Gen Psychiatry 51:477–84, 1994
35. Overman WH, Bachevalier J, Schuhmann E, Ryan P: Cognitive gender differences in very young children parallel biologically based cognitive gender differences in monkeys. Behav Neurosci 110:673–84, 1996
36. Jager TE, Weiss HB, Coben JH, Pepe PE: Traumatic brain injuries evaluated in U.S. emergency departments, 1992–1994. Acad Emerg Med 7:134–40, 2000
37. Consensus Conference: Rehabilitation of persons with traumatic brain injury: NIH Consensus development panel on rehabilitation of persons with traumatic brain injury. JAMA 282:974–83, 1999
38. Sullivan PM, Knutson JF: Maltreatment and disabilities: a population-based epidemiological study. Child Abuse Negl 24;1257–73, 2000
39. Sobsey D, Randall W, Parilla RK: Gender differences in abused children with and without disabilities. Child Abuse Negl 21:707–20, 1997
40. Feldman RS, Salzinger S, Zrosario M, *et al*: Parent, teacher, and peer ratings of physically abused and nonmaltreated children's behavior. J Abnorm Child Psychol 23:317–34, 1995
41. Flisher AJ, Kramer RA, Hoven CW, *et al*: Psychosocial characteristics of physically abused children and adolescents. J Am Acad Child Adolesc Psychiatry 36:123–31, 1997
42. Widom CS, Kuhns JB: Childhood victimization and subsequent risk for promiscuity, prostitution, and teenage pregnancy: a prospective study. Am J Public Health 86:1607–12, 1996
43. Dietz PM, Spitz AM, Anda RF, *et al*: Unintended pregnancy among adult women exposed to abuse or household dysfunction during their childhood. JAMA 282:1359–64, 1999
44. Rudin MM, Zalewski C, Bodmer-Turner J: Characteristics of child sexual abuse victims according to perpetrator gender. Child Abuse Negl 19:963–73, 1995