CRIME Times

Linking Brain Dysfunction to Disordered/Criminal/Psychopathic Behavior

Volume 10, Number 4, 2004

New evidence seen for interaction between MAOA gene, adversity

A new study replicates earlier findings that children's genes can strongly influence their response to childhood adversity.

In 2002, Avshalom Caspi et al. reported that 85 percent of severely abused children with a low-activity variant of a gene influencing levels of monoamine oxidase A (MAOA) later developed antisocial behavior. In contrast, children who experienced similar abuse but had a high-activity variant of the MAOA gene rarely exhibited antisocial behavior in adulthood.

In the new study, Debra Foley and her colleagues studied 514 male twins between the ages of 8 and 17. The researchers assessed each child's exposure to adversity, as well as whether or not the children exhibited symptoms of conduct disorder.

Low monoamine oxidase A activity significantly increased the risk for conduct disorder, the researchers say, but only in the presence of an adverse childhood environment, Interestingly, in children from good backgrounds, the low-activity variant of the MAOA gene was associated with a lower, not higher, risk of conduct disorder. "This is an important finding," Foley et al. say, "because it suggests that

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Biochemical therapy successfully treats assaultive behavior

Identifying and correcting biochemical abnormalities can dramatically reduce violent behavior, according to a new study by William Walsh and colleagues.

Walsh et al. followed 207 consecutive patients with behavior disorders, all treated at the Pfeiffer Treatment Center. The patients, who ranged in age from 3 to 55 and included 149 males and 58 females, had received diagnoses of attention-deficit disorder, conduct disorder, oppositional-defiant disorder, or other behavior disorders. Ninety-five percent had previously undergone behavior modification, psychotherapy, conflict resolution therapy, or counseling, and 85 percent had undergone treatment with Ritalin, antidepressants, or other psychotropic drugs, but these treatments had been unsuccessful.

> Of assaultive patients who complied with treatment, Walsh and colleagues say, 92 percent reported a reduced frequency of assaults, with more than half totally ceasing this behavior.

All patients received testing to identify problems including metal-metabolism disorders, methylation problems, disordered pyrrole chemistry, heavy metal overload, malabsorption syndromes, and impaired glucose regulation. Each patient then underwent an individualized program of nutritional supplementation to remediate identified biochemical abnormalities.

Following each patient for four to eight months after treatment began, the researchers found that 76 percent complied with therapy. (Half of the noncompliant group never began the therapy, while the other half complained of nausea, vomiting, or a dislike of swallowing pills.) In the treatment-compliant group, the researchers say, "A reduced frequency of assaults was reported by 92 percent of… assaultive patients, with 58 percent achieving elimination of the behavior." Eighty-eight percent of compliant patients with destructive behavior reported a reduced frequency of destructive acts, with 53 percent reporting a complete cessation of destructive behavior. Younger patients responded the most positively to treatment.

These results, Walsh et al. say, strongly indicate that individually tailored biochemical interventions can cause significant improvement in patients with chronic behavior problems. "The high incidence of biochemical imbalances in the behavior-disordered population and the major behavioral improvements following the correction of these imbalances suggest that individual biochemistry has a powerful influence on human behavior," they conclude. "Effective prevention of delinquency and crime may require early interventions aimed at normalizing the body chemistries of high-risk children."

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"Reduced violent behavior following biochemical therapy," W. J. Walsh, L. B. Glab, and M. L. Haakenson, *Physiology and Behavior*, Vol. 82, No. 5, October 15, 2004, 835-9. Address: William Walsh, Pfeiffer Treatment Center, 4575 Weaver Parkway, Warrenville, IL 60555.

Boys born prematurely show white matter reductions

Males born prematurely tend to fare worse than "preemie" females, and a new study offers an explanation for the difference.

When Allan Reiss et al. compared MRI brain scans of 65 eight-year-old children born prematurely to scans of a matched group of children born at full term, the researchers found marked reductions in brain volume in the children with a history of prematurity. "In the preterm group as a whole," Reiss says, "we found the volumes of both gray matter and white matter were reduced." Girls born prematurely showed normal white matter volume, while the boys exhibited significant reductions not just in gray matter, but in white matter as well.

> Girls born prematurely showed reductions only in gray matter volume, while boys exhibited significant reductions in white matter as well.

In particular, boys showed reductions in the temporal lobe and the deep cerebral region of the brain. Reiss notes that these areas are involved in language, emotion, attention, and reading, all of which are areas in which children born prematurely often show impairment.

"It's fascinating," says Reiss. "It's as though we're seeing echoes of the 'big bang' of preterm birth at eight years of age."

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"Sex differences in cerebral volumes of 8-year-olds born preterm," A. Reiss, S. Kesler, B. Vohr, C. Duncan, K. Katz, S. Pajot, K. Schneider, R. Makuch, and L. Ment, *Journal of Pediatrics*, Vol. 145, No. 2, August 2004. Address: Allan L. Reiss, Dept. of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, 401 Quarry Rd., Stanford, CA 94305.

Early pollution exposure alters later behavior in sheep

Exposing sheep to environmental pollutants during early development can alter their behavior and emotional reactivity later in life, according to new research.

Hans Erhard and Stewart Rhind studied the behavior of five-month-old lambs exposed before and after birth to slightly elevated levels of pollutants, due to the application of sewage sludge to the pastures on which they and their mothers grazed. Comparing these sheep to sheep raised on minimally polluted pastures, the researchers found that the exposed lambs exhibited less activity—an indication of reduced emotional reactivity—when placed in a crate. When allowed to explore, control females showed a normal pattern of greater exploratory behavior than males; in contrast, both males and females in the pollution-exposed group exhibited a high rate of exploratory behavior. This finding, the researchers say, suggests a selective "demasculinizing effect" on behavior in the exposed males.

"The observation of changes in behavioral patterns in response to low levels of exposure to environmental pollutants suggests that exposure to pollutants at even slightly increased concentrations can alter the development of the neuroendocrine system of mammals," the researchers conclude.

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"Prenatal and postnatal exposure to environmental pollutants in sewage sludge alters emotional reactivity and exploratory behaviour in sheep," Hans Erhard and Stewart Rhind, *Science of the Total Environment*, Vol. 332, 2004, 101-8. Address: h.erhard@macaulay.ac.uk.

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DHEA-S levels affect male soldiers' reactions under stress

A hormone called dehydroepiandrosterone sulfate (DHEA-S) may play a powerful role in how well people cope with stress, according to a new study.

Charles Morgan et al. took blood and saliva samples from 25 men enrolled in a military survival school, testing the men before, during, and after they participated in the school's psychologically and physically grueling regimen. The soldiers also filled out surveys rating their levels of dissociation (an "out-of-touch" feeling associated with post-traumatic stress disorder).

> Soldiers with higher DHEA-S levels performed better under stressful conditions, and exhibited fewer symptoms of dissociation.

The researchers found that soldiers with the highest ratio of DHEA-S to cortisol reported the fewest symptoms of dissociation, and exhibited the most superior military performance. Morgan and colleagues conclude, "These data provide prospective, empirical evidence that the DHEA-S level is increased by acute stress in healthy humans and that the DHEA-S-cortisol ratio may index the degree to which an individual is buffered against the negative effects of stress."

DHEA-S is secreted by the adrenal cortex. Levels are highest in young adults, declining to one-fifth

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Treating iron deficiency improves preschoolers' attention

Treating iron deficiency in preschoolers can significantly improve their attention skills and performance, according to a recent study.

Elizabeth Metallinos-Katsaras and colleagues studied 49 children between the ages of three and four. Of the children, 21 were anemic and 28 had normal iron levels. The researchers gave the children either 15 mg of iron or a placebo for two months.

After treatment, the researchers say, the children who initially were iron-deficient made fewer errors of commission on cognitive tasks, exhibited higher accuracy, and were significantly more efficient than iron-deficient children given the placebo. No changes were seen in the preschoolers who initially had normal iron stores.

The researchers say their findings indicate that "iron supplementation of iron-deficient anemic preschoolers results in an improvement in discrimination, specifically selective attention."

Previous research has linked iron deficiency to impaired cognitive skills in adolescent girls (see *Crime Times* Vol. 3, No. 3, 1997, p. 7), hyperactivity and conduct disorder (see *Crime Times* Vol. 1, No. 4, 1995, p. 7), and aggression (see *Crime Times* Vol. 4, No. 1, 1998, p. 1).

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"Effect of iron supplementation on cognition in Greek preschoolers," E. Metallinos-Katsaras, E. Valassi-Adam, K. G. Dewey, B. Lonnerdal, A. Stamoulakatou, and E. Pollitt, *European Journal of Clinical Nutrition*, June 30, 2004 (epub).Address: Elizabeth Metallinos-Katsaras, Simmons College, 300 The Fenway, Boston, MA 02215.

Phytoestrogens again linked to aggression

Earlier this year, Neal Simon and colleagues reported that male macaques fed high-soy diets exhibited significantly more aggression than those ingesting low levels of soy (see *Crime Times* Vol. 10, No. 3, 2004). The researchers speculated that a diet high in soy—which contains hormone-mimicking phytoestrogens—alters the effects of estrogen receptors in ways that promote aggressive behavior.

A new study by Tim Moore et al., this one involving male hamsters, reports similar findings. In this study, adult hamsters fed a diet high in phytoestrogens reacted more aggressively to a non-threatening intruder than control animals fed a phytoestrogen-free diet. In addition, testosterone levels were higher in the phytoestrogen-fed hamsters than in the controls. When the researchers repeated the results with juvenile hamsters, only nonsignificant increases in aggression were seen in the phytoestrogen-fed group, but this group again had higher testosterone levels. Post mortem studies of both adult and juvenile phytoestrogen-fed hamsters revealed alterations in binding for vasopressin 1A receptors.

The researchers conclude, "These data present the first evidence that phytoestrogens can affect aggressive behavior and, concurrently, alter hormonal status and stimulate changes in the brain of male hamsters."

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"The neurobehavioral effects of phytoestrogens in male Syrian hamsters," T. O. Moore, M. Karom, and L. O'Farrell, *Brain Research*, Vol. 1016, No. 1, July 30, 2004, 102-10. Address: Tim Moore, Department of Psychology, Clark Atlanta University, 223 James P. Brawley Drive, Atlanta, GA 30314, tmoore1@bellsouth.net.

Twin study: high heritability seen for externalizing behaviors

Antisocial behavior, drug abuse, and alcoholism tend to run in families, and a new study suggests that this is largely due to genetic transmission of a general vulnerability to externalizing disorders.

Brian Hicks and colleagues studied 542 families participating in the Minnesota Twin Family Study. All of the families consisted of 17-year-old identical or fraternal twins and their biological mothers and fathers.

The researchers found that a general vulnerability to externalizing disorders (a term encompassing antisocial behavior, conduct disorder, substance abuse, and other externally-directed behavior problems) was "highly heritable" (heritability estimate .80), while no evidence was seen for genetic transmission of specific externalizing disorders.

When the researchers compared siblings to each other, they detected an increased likelihood for the twins to exhibit similar specific problems (such as alcoholism or drug addiction). These effects were the same for fraternal and identical twins, indicating that environmental factors such as peer pressure may influence the way in which a genetic vulnerability to externalizing behaviors is expressed.

> Hicks et al. say their findings suggest that environmental factors may influence the way in which a genetic vulnerability to externalizing behaviors is expressed.

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"Family transmission and heritability of externalizing disorders: a twin-family study," B. M. Hicks, R. F. Krueger, W. G. Iacono, M. McGue, and C. J. Patrick, *Archives of General Psychiatry*, Vol. 61, 2004, 922-28. Address: Brian M. Hicks, Dept. of Psychology, University of Minnesota, 75 E. River Rd., Minneapolis, MN 55455.

DHEA-S levels affect stress

(continued from page 3)

of young-adult levels by age 80. Low levels of DHEA-S are tentatively linked to depression and memory loss.

Conversely, a high DHEA-S-to-cortisol level is sometimes associated with negative behaviors, according to other research. High plasma levels of DHEA-S and low levels of cortisol (or a decreased cortisol response to stress) have been linked to antisocial behavior in childhood, and Laure Buydens-Branchey and Mark Branchey recently reported that male adult cocaine addicts with a retrospective diagnosis of childhood conduct disorder had significantly higher DHEA-S levels, and secreted less cortisol when stressed, than addicts without a history of childhood conduct problems.

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"Relationships among plasma dehydroepiandrosterone sulfate and cortisol levels, symptoms of dissociation, and objective performance in humans exposed to acute stress," C. A. Morgan III, S. Southwick, G. Hazlett, A. Rasmusson, G. Hoyt, Z. Zimolo, and D. Charney, *Archives of General Psychiatry*, Vol. 61, No. 8, Aug. 2004, 819-25. Address: Charles Morgan, National Center for Post-Traumatic Stress Disorder, Veterans Affairs New England Healthcare System, West Haven, CT 06516.

—and—

"Cocaine addicts with conduct disorder are typified by decreased cortisol responsivity and high plasma levels of DHEA-S," L. Buydens-Branchey and M. Branchey, *Neuropsychobiology*, Vol. 50, No. 2, 2004, 161-6. Address: Laure Buydens-Branchey, New York Harbor Healthcare System, Brooklyn Campus, 800 Poly Place, Brooklyn, NY 11209.

FAS, FAE: high toll reported

A recent study confirms that children suffering from fetal alcohol syndrome (FAS) or a milder syndrome called fetal alcohol effects (FAE) are at high risk for criminal conviction or other serious life problems.

Ann Streissguth et al. evaluated 415 patients with FAS or FAE, and found that for adolescents and adults, the lifespan prevalence for disrupted schooling was 61 percent. The lifespan prevalence for problems with the law was 60 percent, and the prevalence for incarceration or confinement in a psychiatric institution or alcohol/drug unit was 50 percent. Nearly half of the subjects had repeatedly exhibited inappropriate sexual behaviors, and more than one-third had histories of alcohol or drug problems. Early diagnosis and a stable environment reduced these risks, but they still remained high.

—

"Risk factors for adverse life outcomes in fetal alcohol syndrome and fetal alcohol effects," A. P. Streissguth, F. L. Bookstein, H. M. Barr, P. D. Sampson, K. O'Malley, and J. K. Young, *Journal of Developmental and Behavioral Pediatrics*, Vol. 25, No. 4, August 2004, 228-38. Addresss: Ann Streissguth, Dept. of Psychiatry and Behavioral Sciences, Fetal Alcohol and Drug Unit, University of Washington School of Medicine, Seattle, WA 98195, astreiss@u.washington.edu.

Gene, adversity interact

(continued from page 1)

specific genotypes may be associated with increasing or decreasing risks for psychiatric disorder contingent on environmental exposures."

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"Childhood adversity, monoamine oxidase A genotype, and risk for conduct disorder," D. L. Foley, L. J. Eaves, B. Wormley, J. L. Silberg, H. H. Maes, J. Kuhn, and B. Riley, *Archives of General Psychiatry*, Vol. 61, 2004, 738-44. Address: Debra Foley, Dept. of Human Genetics, Virginia Commonwealth University, P.O. Box 980003, Richmond, VA 23298-0003.

Asymmetry of body parts linked to aggressive tendencies

How aggressive will a person become if provoked? One possible clue, researchers at Ohio State University say, is how asymmetrical the person's body parts are.

Zeynep Benderlioglu and colleagues note that asymmetries, such as differently sized ears or feet, can reflect stressors during pregnancy, such as poor health or exposure of the fetus to tobacco, alcohol, or other toxins. "The same stressors, Benderlioglu says, "will also affect development of the central nervous system, which involves impulse control and aggression."

The same prenatal stressors that cause physical anomalies, Benderlioglu says, "will also affect development of the central nervous sytem, which involves impulse control and aggression."

To determine if asymmetries were associated with levels of aggression, Benderlioglu and colleagues recruited 51 male and 49 female college students to participate in a laboratory study in which the subjects made phone calls asking for charitable donations. While the participants believed that the calls were real and that the researchers were studying the persuasiveness of their sales pitches, in reality the callers reached research assistants involved in the study. One respondent reacted politely but declined to donate, while the second was rude and confrontational. To judge how aggressive the callers became, the researchers measured the forcefulness with which they slammed the phone receivers down after their appeals were rejected.

Before starting the experiment, Benderlioglu and colleagues measured the symmetry of the participants' fingers, palm heights, wrist diameters, elbow widths, ear sizes, foot breadths, and ankle circumferences. They found that, in general, the more asymmetry a subject exhibited, the more aggressive he or she would be in hanging up the phone. Interestingly, a greater degree of asymmetry in male subjects was associated with increased aggression only during the low-provocation calls, while increased asymmetry in women was associated with aggression only during the high-provocation calls. The same pattern also occurred when the researchers measured testosterone levels, with high testosterone predicting male aggression in the low-provocation call and female aggression in the high-provocation call.

The researchers say their findings suggest that individuals with both high levels of body asymmetry and high levels of testosterone may be particularly aggressive when provoked.

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"Fluctuating asymmetry predicts human reactive aggression," Z. Benderlioglu, P. W. Sciulli, and R. J. Nelson, *American Journal of Human Biology*, Vol. 16, No. 4, July-August 2004, 458-69. Address: Zeynep Benderlioglu, Department of Psychology, Ohio State University, Columbus, OH 43210, benderlioglu.1@osu.edu.

—and—

"Aggressive tendencies may be revealed by asymmetry in body parts, study finds," news release, Ohio State University, August 20, 2004.

Crime Times is interested in hearing from readers conducting research pertaining to biological influences on criminality and psychopathology. Reprints of research papers are appreciated.

Transfer of single gene creates faithful voles

Simply by transferring a gene, scientists report, they can transform promiscuous male meadow voles into monogamous animals—evidence that the ability to form lasting relationships is dictated to a great degree by genetics.

In the brains of prairie voles (which are monogamous), high levels of receptors for the neurochemical vasopressin are found in the ventral pallidum—one of the brain's "reward centers." Meadow voles, which seek out multiple partners, lack vasopressin receptors in the ventral pallidum. To see if this difference could help to explain the mating behavior of the two types of voles, Miranda Lim and colleagues used a harmless virus to transfer the vasopressin receptor gene from prairie voles into the ventral pallidum of male meadow voles.

The researchers found that in response to the gene transfer and resulting increase in vasopressin receptors, the meadow voles began to display a strong preference for their current partners, rather than seeking out new females. While Lim et al. note that many genes are involved in mating behavior, they say, "Our study… provides evidence, in a comparatively simple animal model, that changes in the activity of a single gene can profoundly change a fundamental social behavior of animals within a species."

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"Enhanced partner preference in a promiscuous species by manipulating the expression of a single gene," M. M. Lim, Z. Wang, D. E. Olazabal, X. Ren, E. F. Terwilliger, and L. J. Young, *Nature*, Vol. 429, No. 6993, June 17, 2004, 754-7. Address: Miranda Lim, Center for Behavioral Neuroscience, Emory University, Atlanta, GA 30322. See also: "Researchers make promiscuous animals monogamous by manipulating genes," news release, Emory University, June 16, 2004.

A decade of books: quotes from the Crime Times library

In recognition of the tenth anniversary of Crime Times*, we are foregoing our usual book review page and instead offering a selection of quotes from the books reviewed by* Crime Times *over the past decade:*

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"The evidence for a substantial heritability for IQ is no longer seriously in doubt. Personality has likewise been shown to have significant genetic involvement.... Inasmuch as criminal behavior is associated with intelligence and personality, and inasmuch as personality and intelligence have genetic influences on them, then it follows logically, as night follows day, that criminal behavior has genetic ingredients."

R.J. Herrnstein in Crime*, edited by James Q. Wilson and Joan Petersilia (reviewed in* Crime Times *Vol. 1. No. 3)*

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"The reality is that there are no genes for crime as such; rather, there are genes that code for proteins and enzymes that can influence physiological processes which can in turn predispose an individual toward crime."

The Psychopathology of Crime *by Adrian Raine (reviewed in* Crime Times *Vol. 1, No. 4)*

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"Future research should be conducted by an interdisciplinary team composed of a nutritionist, a criminologist, a physician, a correctional research specialist, and a neurophysiologist."

Diana H. Fishbein and Susan E. Pease in The Psychobiology of Aggression*, edited by Marc Hillbrand and Nathaniel J. Pallone (reviewed in* Crime Times *Vol. 2, No. 3)*

"A psychiatrist can always fish for some underlying problem and spot conflict in any family. But to conclude that criminal behavior stems from obvious family psychopathology is a mistake."

Inside the Criminal Mind *by Stanton Samenow (reviewed in* Crime Times *Vol. 2, No. 4)*

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"It is only within the relatively recent past that major technological advances in the neurosciences have made it possible to record brain activity and later to map that activity through technologically powerful imaging devices. Concomitantly, an explosion of knowledge in psychopharmacology and psychoendocrinology has yielded new understandings of a panoply of interactions between brain morphology and functioning, neurochemistry, and emotional and behavioral disorder."

Tinder-Box Criminal Aggression *by Nathaniel J. Pallone and James J. Hennessy (reviewed in* Crime Times *Vol. 3, No. 1)*

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"Over the years it has become increasingly clear.... that most sentences intended to deter violent crimes ignore the state of mind most perpetrators are in at the time of their violent acts. In theory punishment as a deterrent makes sense; in reality it is often irrelevant."

Guilty by Reason of Insanity *by Dorothy Otnow Lewis (reviewed in* Crime Times *Vol. 5, No. 2)*

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"ADD used to be thought of as a disorder of hyperactive boys who outgrew it before puberty. We now know that most people with ADD do not outgrow the symptoms of this disorder and that it frequently occurs in girls and women. It is estimated that ADD affects seventeen million Americans."

Change Your Brain, Change Your Life *by Daniel G. Amen (reviewed in* Crime Times *Vol. 5, No. 3)*

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"Already, what we know about the biological and chemical roots of violence, from neurotransmitter levels to brain damage and dysfunction, represents a severe problem for the moralist and the penologist. How free is our will, when our internal mechanisms deny us the concept of conscience? How should we be punished, when our actions are in great degree beyond our control?"

Anne Moir and David Jessel in A Mind to Crime *(reviewed in* Crime Times *Vol. 5, No. 4)*

—§—

"Although relatives and friends of an antisocial need to think about how their behavior might influence him, they also should realize that his disorder probably is rooted in biological processes beyond their control. Likewise, they should not hold themselves responsible if treatment fails."

Bad Boys, Bad Men *by Donald Black (reviewed in* Crime Times *Vol. 7, No. 1)*

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"We legal professionals have deluded the public by our silence (or worse, our ignorance) into thinking that punishment and a base desire for revenge will somehow stop crime. Politicians have done worse and routinely capitalize on "toughness" by proposing long-term imprisonment as a panacea for crime control. Unfortunately, it is not. We can no longer ignore the problem of a correction system that does not correct and a justice delivery system that is not just."

Sentencing: As I See It *by Judge Richard I. Nygaard (reviewed in* Crime Times *Vol. 7, No. 2)*

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RESEARCH IN BRIEF

Language impairment, behavior problems again linked

Language-impaired children are at elevated risk of developing antisocial behaviors in young adulthood, according to a new study.

E. B. Brownlie and colleagues report that "language impaired boys had higher levels of parent-rated delinquency symptoms by age 19 than boys without language impairment," even when the researchers controlled for verbal IQ, family influences, and demographic factors. In addition, language-impaired boys reported more arrests and convictions than did controls. No link between antisocial behavior and language impairment was seen in girls.

These findings are consistent with other research (see *Crime Times* Vol. 10, No. 3, 2004, p. 1) showing a high rate of language impairment in children with conduct disorder.

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"Early language impairment and young adult delinquent and aggressive behavior," E. B. Brownlie, J. H. Beitchman, M. Escobar, A. Young, L. Atkinson, C. Johnson, B. Wilson, and L. Douglas, *Journal of Abnormal Child Psychology*, Vol. 32, No. 4, August 2004, 453-67. Address: E. B. Brownlie, Psychology Department, Simon Fraser University, Burnaby, BC, Canada.

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Prenatal cocaine alters behavior

Boys chronically exposed to cocaine before birth are more likely than other boys to exhibit behavior problems in school, according to a new study.

Virginia Delaney-Black et al. evaluated 473 children between the ages of six and seven, of whom about 200 were prenatally exposed to cocaine. Those whose mothers tested positive for cocaine in the urine at the time of birth were considered to be "persistently" exposed.

Using teacher evaluations, the researchers determined that boys persistently exposed to cocaine before birth had more behavioral problems, deficits in abstract thinking, and impairments in motor skills than children who were not exposed. These effects, they say, were "moderate to large." No similar effects were seen in cocaine-exposed girls.

—

"Prenatal cocaine: quantity of exposure and gender moderation," V. Delaney-Black, C. Covington, B. Nordstrom, J. Ager, J. Janisse, J. Hannigan, L. Chiodo, and R. Sokol, *Journal of Developmental and Behavioral Pediatrics*, Vol. 25, August 2004, 254-63.

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Genes affect academic scores

Genes are known to strongly influence cognitive ability, and a new twin study indicates that they influence school achievement as well.

Sheila Walker et al. asked teachers to evaluate the math and English performance of more than 1,000 seven-year-old monozygotic (identical) or dizygotic (fraternal) twin pairs. The identical twins were almost twice as similar in academic performance as the fraternal twins, indicating a strong genetic influence, since identical twins share twice as many genes as fraternal twins.

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"Nature, nurture and academic achievement: a twin study of teacher assessments of 7-year-olds," S. O. Walker, S. A. Petrill, F. M. Spinath, and R. Plomin, *British Journal of Educational Psychology*, Vol. 74, Pt. 3, September 2004, 323-42. Address: Sheila Walker, Social, Genetic and Developmental Psychiatry Research Centre, Institute of Psychiatry, King's College, London, UK, sheila.walker@iop.kcl.ac.uk.

A decade of books

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"(T)here is good evidence that most behaviors, especially in humans, are genetically complex; that is, they are influenced by not just one gene, but by many."

Are We Hardwired? *by William Clark and Michael Grunstein (reviewed in* Crime Times *Vol. 7, No. 4)*

—§—

"Scientists still do not have a complete understanding of how PCBs impair neurological development in the womb and early in life, but emerging evidence suggests that the ability of PCBs to cause brain damage stems in part from disruption to another component of the endocrine system, thyroid hormones."

Our Stolen Future *by Theo Colborn, Dianne Dumanoski, and John Peterson Myers (reviewed in* Crime Times *Vol. 8, No. 4)*

—§—

"(T)he evidence is overwhelming that every aspect of our mental lives depends entirely on physiological events in the tissues of the brain."

The Blank Slate *by Steven Pinker (reviewed in* Crime Times *Vol. 9, No. 2)*

—§—

"Strong and early evidence for the role of genetic factors came from the observation that sociopathic and alcoholic fathers produced a significantly higher rate of sociopathic children (32%) than did fathers without this diagnosis (16%)."

Biosocial Criminology *by David E. Comings (reviewed in* Crime Times *Vol. 10, No. 3)*

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QUOTABLE "When nutritional deficiencies occur at critical moments of construction, the brain may look identical under the microscope or in a PET scan. The child will certainly appear normal.... [But] subclinical deficiencies occurring during the process of development may diminish the child's ability to reason or consider consequences of bad behavior, or to be cheerful—or a hundred other 'defects of character.' When we see those behaviors in children, we don't think of the diet. We naturally blame parents for bad parenting. Is it possible that some of the tissue that was supposed to create logical thinking or a happy temperament wasn't laid properly into the brain structure at the beginning?"

—Carol Simontacchi, in
The Crazy Makers

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