

Criminal Intellectuals

Researchers look at why lawbreakers often brandish low IQs

By BRUCE BOWER

Second of two articles

Folk wisdom holds that crime doesn't pay — unless it inspires a big book deal or a lurid television miniseries. Scientific data suggest that, even if miscreants do reap big bucks from a dramatized version of their lives, most have been short-changed in the cognitive currency of IQ points.

Intelligence deficits make up one of the most firmly established characteristics of criminal offenders as a whole. Research consistently places the average IQ of convicted lawbreakers at 92, some 8 points below the population average and 10 points below the average for law-abiding folks. Available data also suggest that offenders who get away with their crimes fare no better on intelligence tests than those who get nabbed and convicted.

IQ scores often dip most sharply for serious, repeat offenders, a small set of primarily young men who commit a majority of all crimes.

At the same time, youngsters being raised by abusive, unstable parents or living in crime-ridden neighborhoods who nevertheless refrain from delinquency often have above-average IQs.

Of course, as political scientist Charles Murray and the late psychologist Richard J. Herrnstein note in *The Bell Curve* (1994, Free Press, New York), most people who score poorly on intelligence tests lead law-abiding lives. Increases in crime over the past 30 years do not spring from a general decline in intelligence, they point out; however, poorly understood influences may boost the appeal of crime for people of low cognitive ability.

Clues to the nature of those influences, as well as to personality traits other than low IQ that contribute to criminality, are emerging from studies that track individuals from childhood into their teens and beyond. In particular, impulsivity — a personality disposition marked by a tendency to act without forethought, to seek instant gratification,

to shift attention quickly, and to overreact to minor frustrations — appears closely aligned with criminal behavior. Some researchers suspect that impulsive youngsters veer toward delinquency regardless of their IQ, whereas other scientists theorize that impulsivity simultaneously erodes both a child's intelligence and his or her law-abidingness.

"The accumulated data show that IQ and impulsivity are each related to delinquency independently of each other," argues Terrie E. Moffitt, a psychologist at the University of Wisconsin-Madison. "Our results also suggest that poor verbal ability is the 'active ingredient' for delinquency in the [overall] IQ."

Moffitt and Avshalom Caspi, also a University of Wisconsin psychologist, direct research focusing on two populations of young people living in different parts of the world. The first, a group of more than 1,000 men and women born 23 years ago in Dunedin, New Zealand, has completed a battery of psychological, medical, and sociological

poor, single-parent families. Half of the participating youngsters were identified as prime candidates for future delinquency and criminal behavior, based on interviews with teachers, caregivers, and the boys themselves. In 1990, when the boys averaged 12 to 13 years old, most were administered a series of psychological tests.

Moffitt divides delinquents into two categories: a great many who break laws only during adolescence as a way of coping with the lack of adult responsibilities and privileges, and a small minority of hard-core offenders whose penchant for aggressive and impulsive behavior stretches back to early childhood (SN: 5/1/93, p.282).

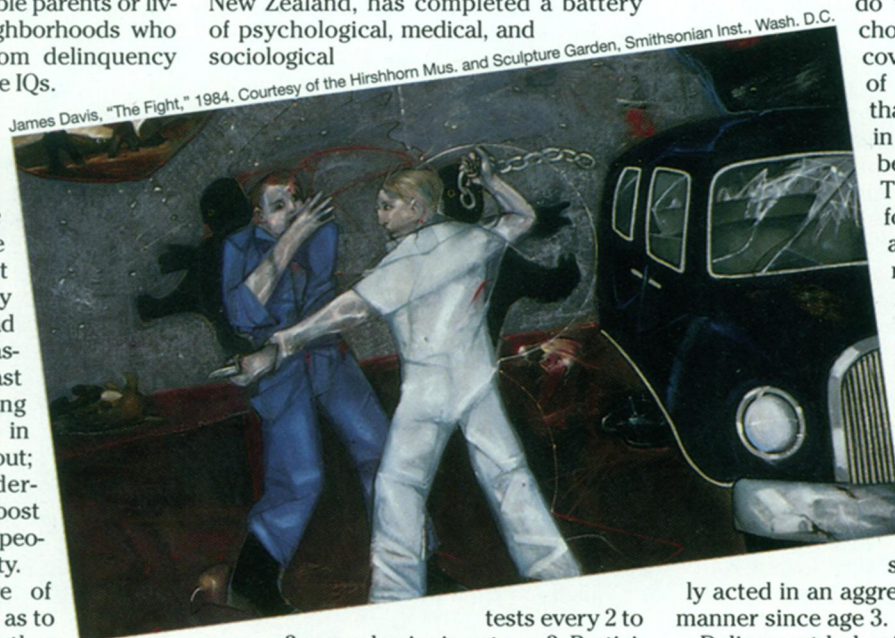
Subtle disturbances of brain function, probably inflicted in the womb or shortly after birth, may foster language difficulties and attention problems that pave the road to hard-core delinquency, Moffitt proposes.

In support of this theory, she points out that 13-year-old New Zealand boys who

do worst on neuropsychological tests (which cover a broader range of mental functioning than IQ tests) engage in the most delinquent behavior at age 18. This pattern holds for delinquency rates assessed by self-reports, recorded run-ins with police, and court convictions, Moffitt and her colleagues report in the May 1994 *CRIMINOLOGY*. What's more, boys clinging to the lowest rungs of the neuropsychological scales had frequent-

ly acted in an aggressive and impulsive manner since age 3.

Delinquent behavior showed a particularly close link to problems in two neuropsychological realms — verbal skills (such as reasoning with new ideas) and verbal memory (the number of trials needed to memorize a list of nouns and the number of those nouns later recognized when heard in a story). Moffitt



tests every 2 to 3 years, beginning at age 3. Participants are mostly white, with a small number identified as Maori or Polynesian.

The second sample consists of 508 boys, about evenly split between blacks and whites, recruited as fourth graders from Pittsburgh public schools in 1987. About 40 percent of the boys come from



Leon Golub, "Riot III," 1984, Courtesy Rhona Hoffman Gallery, Chicago

with few other positive sources of adult advice, Moffitt's team contends. Early school failure, based on frustration with academics and all it represents, allows neighborhood delinquents and other pressures to "rush in and fill the void," they maintain.

Two personality traits also promote delinquency in the New Zealand and Pittsburgh youngsters. Throughout their lives, crime-prone individuals displayed impulsivity and what Moffitt and her coworkers call negative emotionality — frequently experiencing anxiety, anger, irritability, and difficulty dealing with stressful situations.

A person bearing this pair of dispositions may easily perceive menace in others' behavior and in the

unavoidable difficulties of daily life, sparking increasingly aggressive and volatile responses, the scientists suggest. Parents who mete out harsh, inconsistent discipline in an emotionally chaotic home probably intensify negative emotionality and impulsivity in children who have a biological predisposition to these traits, Moffitt's team adds.

Their conclusion challenges the view, popular among criminologists, that personality plays no significant role in fostering crime. Most criminologists emphasize the effects of social forces — such as poverty and unemployment — on crime.

Signs of a troubled personality — including irritability, impulsive behavior, and exaggerated emotional responses — generally appeared by age 3 in

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suspects that poorly understood glitches in brain functioning unique to the most crime-prone boys prevent them from efficiently using language to communicate with others.

In contrast, New Zealand boys who developed their first taste for delinquency as adolescents performed well on all neuropsychological tests.

Low IQ scores may reflect the significant handicap some children experience from the start in expressing themselves and remembering information, Moffitt holds. The inability of these youngsters to forge constructive relationships with parents, peers, and teachers greatly increases their chances of graduating from early school failure and behavior problems to a life of crime, the Minnesota psychologist theorizes.

"I'd put my money on public health programs to improve infant health and prenatal care as the best ways to prevent delinquency," Moffitt says.

Efforts to encourage involvement in school and academic success may also cut down on law-breaking, particularly by black males, she adds. An analysis of the Pittsburgh boys, published in the May 1993 *JOURNAL OF ABNORMAL PSYCHOLOGY*, finds the lowest IQs clustered among the most delinquent youngsters, regardless of race, family income, or the effort a child expended in completing an IQ test. Not surprisingly, low-IQ boys of both races did poorly at school. But the existence of serious academic problems, even among those with average or high IQs, raised the likelihood of finding delinquency only among black youths.

School may serve as an outpost of guidance and supervision to black males growing up in blighted neighborhoods

IQ Meets MQ

Consider the intelligent, law-abiding, professionally successful person who flops as a friend, spouse, or parent (not to mention manager or boss). He or she fails to qualify as a "mensch," a Yiddish word for a person who treats others with respect and dignity and who negotiates the social world with zest and compassion.

Jack Block, a psychologist at the University of California, Berkeley, estimates what might be called a person's mensch quotient on a 14-item questionnaire that probes for friendliness, generosity, thoughtfulness, curiosity, and a preference for new and interesting experiences. He and Berkeley colleague Adam Kremen find that MQ, which they more soberly deem ego-resiliency, and IQ have important and largely separate effects on how personality is expressed.

"A high IQ correlates with making more money and not breaking the law, but some people with high IQs have many problems realizing satisfying human connections," Block asserts. "People high in ego-resiliency live much easier in the world, whatever their IQs."

Block and Kremen's study, now submitted for publication, focuses on 49 women and 46 men who completed ego-resiliency and IQ tests at ages 18 and 21. Scores at both ages were averaged for each participant. Observations and interviews conducted by six experimenters yielded detailed personality descriptions for each volunteer at age 21.

The researchers then statistically sifted out personality features uniquely linked either to ego-resiliency or IQ.

Both men and women scoring in the upper ranges of ego-resiliency showed a flair for social life. They dealt well with stress, resolved personal conflicts quickly, and maintained many friend-

ships. Self-concern, rumination, and fearfulness characterized individuals short on ego-resiliency.

Spontaneity, playfulness, and the direct expression of emotions particularly applied to ego-resilient women, whereas a capacity for commitment to goals, responsibility to others, and empathy best characterized their male counterparts.

Women scoring low on ego-resiliency entertained much self-doubt and introspection; men in the same category often expressed hostility toward others, felt cheated in life, and experienced extreme mood swings.

In general, high-IQ individuals valued intellectual matters, had a wide range of interests, were dependable, and performed well in school and at work. However, women in whom high IQ greatly outweighed ego-resilience also tended to feel anxious, dwell on their thoughts, and frequently experience guilt. Men armed mainly with high IQs were highly critical of others, fastidious, uneasy with sexuality, and emotionally bland.

On the other hand, both men and women primarily characterized by a low IQ tended to be assertive, oriented toward sexuality, and self-indulgent. Low-IQ men also displayed self-doubt and feelings of helplessness.

In the absence of ego-resilience, a hefty supply of intelligence may shore up men's self-image and sense of personal control, the researchers assert. However, a high IQ offers far less comfort to women who lack ego-resiliency. This may reflect the greater emphasis placed on male mastery of tasks outside the interpersonal world, the researchers note.

One thing seems clear: Wherever you fall on IQ's bell curve, it helps to have a high MQ. — B. Bower

those New Zealanders displaying negative emotionality and impulsivity at age 18. Three-year-olds classified with these problems later displayed the highest rates of adolescent delinquency, Caspi and his coworkers report in the February CHILD DEVELOPMENT. As teenagers, they acknowledged their pleasure at causing discomfort to others, yet felt mistreated, deceived, and betrayed by those around them.

Impulsivity comes in two forms, Moffitt adds. In the Pittsburgh sample, fourth graders who rated high in behavioral impulsivity — marked by frequent aggression, unplanned acts, and a need for instant gratification — displayed the most delinquency as 12- to 13-year-olds. Cognitive impulsivity, a type of rushed, unfocused thinking that saps concentration and the conscious control of one's thoughts, showed a stronger link to low IQ than to delinquency.

Diminished intelligence, as measured by IQ, may lead to cognitive impulsivity, Moffitt's team argues in the May 1994 JOURNAL OF ABNORMAL PSYCHOLOGY. Conversely, it is also possible that cognitively impulsive kids cannot attend to and absorb information at school that they need to perform well on IQ tests.

However it's measured, impulsivity helps both to groom children for delinquency and to rob them of IQ points, asserts Jack Block, a psychologist at the University of California, Berkeley. In a statistical reanalysis of the Pittsburgh data, Block finds — contrary to what Moffitt and her coworkers reported — that fourth graders scoring high in behavioral impulsivity are much more likely to take up delinquency than those scoring poorly on an IQ test.

Impulsive boys in general register less of the school-imparted information and reasoning logic on which verbal sections of IQ tests depend, the Berkeley psychologist contends in the May JOURNAL OF ABNORMAL PSYCHOLOGY. Not only do these youngsters derive fewer benefits from instruction, but they probably miss more school days than their peers, he argues. Some evidence points to marked jumps in IQ as people spend more time in school (SN: 9/21/91, p.187). Thus, poor school attendance may undermine the IQ of an impulsive youngster, even if the child has a healthy brain, in Block's view.

"Impulsivity fouls up learning and drags down IQ over time," Block maintains.

In contrast, Bruce F. Pennington, a psychologist at the University of Denver, suggests that in many cases of hard-core delinquency, low verbal IQ scores tap into only a small part of a deeper disruption

within the brain's frontal lobes. Damage to frontal tissue can produce strikingly poor decision-making and social skills, even if IQ remains unscathed (SN: 5/21/94, p.326). Frontal sites also orchestrate the development of conscience and empathy, both of which prove scarce in many repeat offenders, the Denver psychologist points out.

Current neuropsychological tests, including those given to the Dunedin and Pittsburgh youths, largely miss signs of frontal lobe impairment, he argues.

Twin and adoption studies indicate that a childhood behavioral disorder linked to later delinquency stems in large part from genetic and early environmental influences, according to Pennington. Scientists need to look more closely at how wayward genes and brain damage suffered in the womb, during birth, or in childhood can harm the frontal lobes and lay the groundwork for law-breaking, he says.

Moffitt doubts that a lasting commitment to crime and aggression springs so directly from inheritance or an impaired brain. Impulsive, low-IQ children enter into progressively deteriorating relationships with parents, teachers, and peers, she asserts; this reinforces a life of emotional volatility and lawlessness.

"Public policy that ignores either low IQ or impulsivity as risk factors for delinquency will be ill-informed by social science research," Moffitt remarks. □

Physics

Ivars Peterson reports from San Jose, Calif., at an American Physical Society meeting

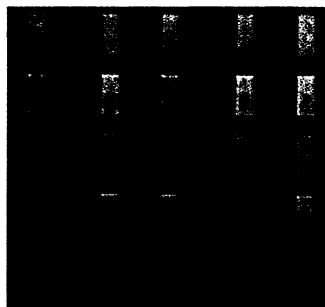
Switching with a light touch

Nowadays, a great deal of information travels as pulses of infrared light along optical fibers. Routing and processing this information requires linking optical signals with electronic circuits. Similar capabilities are needed for sending and receiving optical signals via fiber or air between chips or electronic devices, if optical links replace the copper wires conventionally used for making such connections.

As one step toward developing high-capacity optical switches for information processing, David A. B. Miller and his coworkers at AT&T Bell Laboratories in Holmdel, N.J., have demonstrated a practical method for integrating high-performance gallium arsenide-based optoelectronics with high-density silicon-based circuitry on a single chip.

"You start with silicon integrated circuits, and you can put a large number of these so-called quantum well diodes on top of them," Miller says. Moreover, this fabrication method can readily keep pace with improvements in silicon technology.

Each optical diode, about 15 by 45 micrometers in size, can absorb light to generate electric signals on the chip. At the same time, changing the voltage applied to a diode controls how much light it transmits, allowing the diode to emit a mod-



Miller et al./Bell Labs

Photograph of an array of optical modulator and detector diodes (rectangular slabs) integrated on a silicon chip to provide optical inputs and outputs for electronic circuits.

ulated light beam. "I can write information into these structures, and I can read it out, using hundreds or thousands of light beams at a time," Miller says.

Metal against metal

The causes and characteristics of friction at the atomic and molecular levels have been the subject of a wide range of studies, including computer simulations (SN: 5/30/92, p.360) and experiments involving atomic force microscopes and other surface-sensing instruments (SN: 12/19&26/92, p.429). Now, researchers have created a computer model showing the behavior of atoms when two metal surfaces slide past each other.

Using this simulation, James E. Hammerberg and his colleagues at the Los Alamos (N.M.) National Laboratory can show how the metals deform, setting off vibrations and creating defects in the atomic structure that spread into the materials. These deformations occur because solid surfaces, no matter how well polished, aren't perfectly smooth. Contact between two surfaces takes place at discrete locations where bunches of atoms protrude. Opposing peaks approach each other so closely that attractive forces bind them together. For sliding to continue, these bonds must be broken.

Atomic deformations occur as two blocks of copper (one shown in blue, the other in yellow) slide past each other.



Hammerberg et al./LANL