

Delinquent Developments

Career criminals and temporary law-breakers
may cross paths as teenagers

By BRUCE BOWER

Dunedin lies at the southern end of New Zealand, nearly half a world and a far cry from the gritty, sometimes grim realities of life for youngsters growing up in many U.S. cities. Yet a group of more than 1,000 boys and girls born in Dunedin 21 years ago now offers behavioral researchers provocative clues to the ways in which the timing of puberty, enduring personality traits, and the social world of high school work together to foster different types of juvenile delinquency.

Indeed, only by tracking people from birth through adulthood can scientists unravel the forces that produce lifelong antisocial and criminal behavior, contend Terrie E. Moffitt and Avshalom Caspi, two psychologists at the University of Wisconsin-Madison. Such longitudinal studies may also help delineate why many teenagers make occasional forays into delinquency but avoid a life of crime and stormy personal relationships, they add.

Moffitt and Caspi have collaborated with New Zealand researchers who organized the Dunedin project — formally known as the Dunedin Multidisciplinary Health and Development Study — to analyze data on psychological and behavioral development in the sample.

The Dunedin findings emerge at a time of intense controversy regarding research into crime and violence. Last year, the head of the then Alcohol, Drug Abuse, and Mental Health Administration resigned his position amid controversy over his statements linking inner-city crime to the behavior of monkeys; soon thereafter, federal officials withdrew funds for an upcoming conference addressing genetic influences on crime.

Nearly all criminologists, psychologists, sociologists, and other investigators — including those who organized the ill-fated meeting on the genetics of criminal behavior — routinely reject the idea of a “crime gene” or “born criminals.” At the same time, they note that some partially inherited traits, such as intelligence and temperament, influence the likelihood that individuals will participate in criminal acts.

For instance, in their book *Crime and Human Nature* (1985, Simon & Schuster), political scientist James Q. Wilson of the University of California, Los Angeles, and psychologist Richard J. Herrnstein of Harvard University argue that inherited elements of human nature develop in an intricate web of family and social encounters, and that this complex process helps determine how people choose between the consequences of crime or its alternatives.

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Caspi and Moffitt approach the Dunedin sample from this perspective. In an article accepted for publication in *PSYCHOLOGICAL REVIEW*, Moffitt argues that the findings she has made so far, along with previous data on national crime rates and child development, indicate that teenagers who engage in at least some delinquent acts represent the large majority of adolescents and travel either of two diverging paths toward adulthood.

Poor self-control and aggressive behavior typify virtually the entire lives of a small group of hard-core delinquents in New Zealand, and probably elsewhere, Moffitt contends. A much larger group takes up delinquency as an adolescent avocation because these individuals see no other means to demonstrate their independence and grab a bit of grown-up status, at least until jobs, marriage, and other gateways to adulthood offer greater rewards. For them, delinquency helps bridge the five- to 10-year time warp between the “now” of physical and sexual maturity and the “later” of social maturity, Moffitt argues.

Dunedin-born youngsters who spent their childhoods embroiled in behavioral and school problems and who entered puberty earlier than most of their peers proved the most likely to embrace teenage delinquency, often with a ferocity unmatched by their fellow adolescents, Caspi and Moffitt assert. To help explain this tendency, the researchers theorize that each person responds to new, ambig-

uous situations for which no clear behavioral guidelines exist (for instance, the sudden social pressures to start dating and have sex, applied to girls experiencing early puberty) by leaning more than ever on familiar, well-practiced styles of dealing with others.

Many of Caspi and Moffitt’s predictions about the natural history of antisocial behavior await testing as the Dunedin teenagers reach young adulthood. More-



over, some investigators strongly contest their notion that adolescence and other social transitions magnify an individual’s basic personality traits.

Still, “the New Zealand study exemplifies a trend in developmental psychology toward looking at different pathways by which adolescents arrive at delinquency, depression, eating disorders, and other conditions,” says Jeanne Brooks-Gunn, a psychologist at Columbia University in New York City. “Cross-sectional [one-time] studies tell us nothing about how kids got to where they are.”

The bruising developmental pathway traversed by hard-core teenage delinquents in the Dunedin sample bodes ill for their futures and for those of their spouses and children, Moffitt suspects. In fact, many of these individuals may end up as “career criminals,” the approximately 5 per cent of the population that commits more than half of all recorded adult crimes, Moffitt contends. Their flair

for aggression and for acting on impulse also probably ignites all sorts of interpersonal mayhem, including child and spouse abuse, she adds.

What Moffitt dubs "life-course persistent antisocial behavior" begins in early childhood or even in the womb, in her view, with poorly understood forms of subtle brain damage that foster two major childhood problems: language difficulties that disrupt listening, reading, writing, and verbal memory; and the lack of attentiveness and self-control associated with the psychiatric condition known as attention-deficit hyperactivity disorder (ADHD).

Maternal drug use during pregnancy, poor prenatal nutrition, exposure to lead or other toxic substances, and child abuse or neglect are among the many possible culprits that can sabotage fetal and infant brains, Moffitt notes. Responsive parents may help a toddler leap over early neural stumbling blocks, but given harsh conditions at home, at school, and in the neighborhood, a child's personal and academic problems usually expand while options for change shrink, she argues.

shoplift and skip school at 10, and sell drugs and steal cars at 16. They will probably rob and rape at 22 and embezzle at work and beat their wives at 30, Moffitt predicts.

But these dedicated delinquents got plenty of company from their male compatriots during adolescence, she points out. Pervasive delinquency appeared among one-third of the New Zealand 15-year-olds; when interviewed at age 18, fewer than 1 in 10 boys reported refraining entirely from delinquent acts.

Boys whose delinquency bloomed in their teen years often limited such behavior to particular situations, Moffitt observes. For example, some shoplifted in stores and used drugs with friends, but continued to obey the rules at school.

These youngsters respond to a "maturity gap" that many adolescents must cross in modern societies, Moffitt theorizes. Since the mid-1800s, improved nutrition and health care have lowered the average age of puberty — a trend most clearly seen in the gradually dropping average ages at which menstruation begins among girls — while technological advances have increasingly delayed the

a statement of personal independence among "adolescence-limited" delinquents, Moffitt says, then these actions become increasingly rewarding unless alternative sources of adult status take their place, such as landing a steady job and gaining financial responsibility for one's family.

The two developmental paths trod by teenage delinquents sometimes take unexpected turns, she points out. A "life-course persistent" boy, for instance, may happen upon an adult mentor or a devoted grandparent who shepherds him toward academic achievement and job success. And an "adolescence-limited" delinquent who lives on the mean streets of a large city may join a gang and participate in crimes that lead to a prison record and continuing problems getting an education and a good job.

But early childhood personality styles frequently lead in a predictable way toward either antisocial or well-adjusted adult behavior, Moffitt asserts.

Although epidemiologic studies and crime statistics from several countries indicate that the vast majority of teenagers of both sexes commit an illegal act at some time, researchers know little about youngsters who shun delinquency, Moffitt adds.


In some cases, late puberty may allow a teenager to skip the maturity gap and remain crime free, she suggests. Evidence supporting this proposal comes from an analysis of delinquency among 348 New Zealand girls, reported by Caspi and Moffitt in the July 1991 *JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY*.

Girls who did not menstruate by age 15 tended to avoid delinquency of any kind. Those who began menstruating by age 12 proved much more likely to get in fights, steal, use alcohol and illicit drugs, and commit other delinquent acts.

Early onset of menstruation sparked the most delinquency and emotional difficulties among girls who had displayed behavior problems throughout childhood, Caspi and Moffitt found. It appears that early puberty rudely thrusts girls, as well as boys, into the maturity gap and magnifies the misbehavior of those predisposed to delinquency, the researchers argue.

At the same time, girls show considerable sensitivity to the social context of high school. A further breakdown of the New Zealand data, reported by Caspi, Moffitt, and two co-workers in the January *DEVELOPMENTAL PSYCHOLOGY*, revealed that girls experiencing early puberty engaged in more antisocial behavior if they attended a coed high school rather than an all-girl facility. Late-maturing girls displayed little taste for delinquency at either type of school.

Overall, problem behaviors turned up among a small minority of the 165 New



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An analysis of 435 of the Dunedin boys — whose behavior was evaluated through ratings made by the boys, their parents, and their teachers every other year beginning at age 5 — supports Moffitt's theory. These results first appeared in the June 1990 *CHILD DEVELOPMENT*.

Among the 15-year-old boys, those who frequently engaged in delinquent acts and showed signs of ADHD scored extremely poorly on tests of verbal intelligence and reading ability, while scoring high on family adversity (indicated mainly by low parental income, low maternal IQ, poor maternal mental health, and having a single parent). From age 3 on, they lagged far behind their counterparts on tests of general intelligence and motor coordination. Reading failure dogged them throughout their school years, while their fighting and delinquency progressively worsened.

These boys, who made up 5 percent of the male sample, apparently mold their penchant for violence and misbehavior around the social opportunities at hand, Moffitt says. They bite and hit at age 4,

average age at which people enter the work force. Prior to the last two centuries, youths typically achieved adult status during the teen years, often performing clear rites of passage before entering a craft or assuming responsibility for a family business, Moffitt notes.

For five to 10 years, most of today's teenagers carry the weight of biological maturity without the balance of adult responsibilities and privileges, she asserts. Certain types of delinquent behavior thus gain favor as an avenue to adult power and independence. Perhaps adolescents who have developed relatively normally but find themselves mired in the maturity gap selectively mimic the well-practiced delinquency of "life-course persistent" youths, she proposes. After all, members of this latter group often garner considerable incomes from their illegal activities, sire children out of wedlock, and sport other symbols of having passed straight into the adult world.

If every curfew violated, drug taken, car stolen, and baby conceived serves as

Zealand girls who attended single-sex schools, whereas stealing, drug use, frequent sexual intercourse, and fighting occurred much more often among the 132 girls enrolled at coed schools.

Older students at coed schools, particularly boys, may demonstrate to younger girls the ways in which delinquency severs childhood apron strings and secures, at least from a teenage perspective, adult privileges, the researchers argue.

Few U.S. students attend single-sex schools, which recruit a select group to expensive private institutions, religious schools, or military facilities. But New Zealand maintains many all-girl public secondary schools, which attract students largely on the basis of academic reputation, location, and prior attendance by other family members, Caspi notes. For all its differences from the United States, he says, New Zealand offers a relatively controlled environment in which to study the ways in which puberty interacts with the social realm of high school.

Related findings emerge from a study of 125 U.S. girls attending coed schools and tracked from age 11 to 15 by Brooks-Gunn and her colleagues. Depression, eating problems, and delinquency appeared most often among those who reached puberty early and who encountered a greater number of stressful events than their peers, the researchers assert in *Stress and Coping in Infancy and Childhood* (1992, Tiffany M. Field *et al.*, editors, Lawrence Erlbaum Associates, Hillsdale, N.J.). Such events covered a broad spectrum, including parental divorce, getting a boyfriend for the first time, losing a school election, and not making an athletic team.

Regardless of their age at puberty or the type of high school they attend, some teenagers may harbor personality traits that prove incompatible both with delinquency and with emotional well-being, Moffitt says.

For instance, in a study of 101 boys and girls living in the San Francisco Bay Area and followed from age 3 to 18, Jonathan Shedler and Jack Block — both psychologists at the University of California, Berkeley — found that those who occasionally experimented with drugs as teenagers exhibited the best psychological adjustment. Experimenters used marijuana no more than once a month and had tried no more than one other illicit drug. Frequent drug users, who smoked marijuana once a week or more and had tried at least one other illegal drug, displayed few friendships with their peers, poor self-control, and emotional distress. Teenagers who had never tried marijuana or any other illegal drug exhibited anxiety, difficulty expressing emotions, and few social skills.

In each of the three groups, individuals

often carried over their prominent personality traits from childhood, Shedler and Block report in the May 1990 *AMERICAN PSYCHOLOGIST*.

Drug use certainly does not improve mental health, and it proves highly destructive for frequent users, Shedler and Block point out. "But for adolescents more generally, some drug experimentation apparently does not have psychologically catastrophic implications," they conclude.

Moffitt considers these data congenial to her theory of dual developmental paths leading to teenage delinquency. Drug experimentation wreaks further emotional havoc on "life-course persistent" youths, she argues, but it fails to drag down basically healthy teens navigating the maturity gap. Meanwhile, some adolescent abstainers indulge in their lifelong habit of social isolation and anxiously shrink from the defiance of drug use.

Of course, teenage delinquency responds to other influences, including poverty, unemployment, rising numbers of divorces, lack of parental supervision, and violence displayed through the media. But Moffitt asserts that these factors cannot explain why crime rates charted in the United States and England, as well as in New Zealand, dramatically rise during adolescence and then reverse course as teens reach young adulthood.

Jack Block says participants in the California longitudinal study, which he organized with his late wife, Jeanne H. Block, bear some similarity to the New

Zealand youngsters. A small group of Bay Area teens parlayed childhood behavioral and emotional problems into serious adolescent delinquency, he says, while many well-adjusted teenagers briefly sampled various misbehaviors as part of a search to define themselves.

Block disputes Caspi and Moffitt's theory, however, that deep-seated personality traits intensify during adolescence and other ambiguous transitions. Instead, he argues, a teenager's underlying personality may emerge from the shadows for the first time as parents and other adults begin to relax the behavioral guidelines and restrictions of childhood.

Moreover, some unstructured situations evoke a highly consistent response — caution and noncommittal behaviors — from a wide range of people, he says.

The resolution of debates over the relationship of personality development to delinquency depends on continued longitudinal research, such as the New Zealand and California studies, Block says. Few such projects exist, he asserts, because they are logistically complex, costly, and incapable of generating "fast" data for scientists anxious to publish papers and gain academic tenure.

Moffitt notes another obstacle to unraveling the development of delinquency: Researchers possess a "woeful" lack of knowledge about the meanings that teenagers themselves attach to puberty, high school, and various types of delinquency.

"We can't understand adolescence-limited delinquency without first understanding adolescents," she remarks. □

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Although the Purdue-Emory scheme represents an important first step, the logistics of handling such a network of computers remains exceedingly complicated. Indeed, the software required for binding the system together represents the main bottleneck. In many instances, software deficiencies keep these systems from running as efficiently as possible.

Nonetheless, researchers are optimistic that such problems will eventually be solved. Smarr envisions the development of a national "metacomputer" — an array of different types of computers linked by a high-speed, high-capacity network to act as a single computer.

In a sense, each national supercomputing center already acts as a metacomputer, invisibly shuffling programs and files from supercomputer to massively parallel machine to graphics computer to mass-storage device to workstation. Ordinarily, users need specify only what they would like done, and the center's software takes care of the details of when, where, and how.

Smarr would like to see this concept extended to networks of computers on a national scale. By automatically adjust-

ing to the power and speed required for solving a particular problem, such systems would provide greater flexibility for scientists working on a wide range of applications.

"But we're not there yet," Smarr cautions.

As one step toward "scalable supercomputing" and the development of a national information infrastructure, the four national supercomputer centers last year announced the formation of a national MetaCenter (SN: 11/28/92, p.374). Center staffs are now working together to establish standards so that people can use any computer, or set of computers, at any center.

"This also allows the centers to specialize, rather than trying to be everything to everybody," Smarr says.

In response to the rapid changes in computer technology, the National Science Foundation is reviewing the role of high-performance computing in scientific research and reevaluating the rationale for the national supercomputing centers. Chaired by Lewis Branscomb of Harvard University, the panel charged with the review expects to present its report and recommendations later this month. □