

## Characterizing Criminal Careers

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**Most knowledge about crime and criminals derives from cross-sectional analyses that link crime rates in a community with a community's attributes. The criminal-career approach focuses on individual offenders and considers their crime-committing patterns as a longitudinal stochastic process. This approach, which invokes parameters characterizing participation rate, initiation rate, termination rate and the associated career length, and individual offending frequency, offers some important new insights. For example, annual offending frequency appears to be reasonably constant with age for those offenders who stay criminally active, termination rates are relatively low for active offenders in their 30s, and offending frequencies seem to be relatively insensitive to demographic attributes for active offenders. All these observations are opposite to those that would be derived from cross-sectional analysis.**

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**E**VEN THOUGH THE SUBJECTS OF CRIME AND CRIME CONTROL have been major issues of public debate, and despite their regular appearance as one of the nation's most serious problems, significant advances in empirical research related to these issues are relatively recent. This partly reflects the strong value component in the policy choices. It is also due to the considerable difficulty of observing directly individual crimes or tracking carefully the patterns of offending by individual criminals in order to collect reliable data.

The policy choice at the center of most public debate involves the use of imprisonment, primarily the choice of who should go to prison and for how long. This policy choice involves a sequence of dichotomies (Fig. 1). The objectives of imprisonment involve some combination of retribution—punishment for its own sake—and crime control. Crime control is obtained in macro terms through general deterrence, by communicating symbolically to the public at large that they risk punishment if they commit crimes. At the micro level—involving individual offenders—one can try to incapacitate them, typically through imprisonment, and thereby block their access to potential victims in the community during the period of confinement. Alternatively, one can try to improve their behavior subsequent to some treatment that may focus on punishment (working through individual deterrence) or on enhancing individual skills in legitimate activities (sometimes indicated as rehabilitation).

Information on criminal careers—the longitudinal sequence of offenses committed by individual offenders—is potentially an important element for informing the choices made at the various

decision points. Knowledge about criminal careers is most directly useful for assessing the effects on crime through incapacitation. The magnitude of the incapacitative effect of incarceration depends fundamentally on the nature of criminal careers: the more frequently an individual offender engages in crime, the more benefit that would accrue by removing him from the street and thereby eliminating his opportunity to commit crimes in the community. The dynamics of criminal careers, especially their potential for change, are also relevant for assessing likely rehabilitation or individual deterrent effects. An important question when assessing general deterrence is distinguishing between the impact of deterrent threats in curtailing the careers of already active offenders and in inhibiting initiation of criminal careers among nonoffenders.

Empirical knowledge about criminal careers may even be of value in imposing prison terms for retributive purposes. It is a fundamental principle of U.S. criminal law that individuals should be punished only for crimes that they have committed. In accordance with this principle, the candidates for punishment are limited to those who have been convicted of a current offense. In choosing how much punishment to impose, however, an offender's prior criminal career might reasonably be viewed as a legitimate element—reflecting the offender's blameworthiness—in setting the punishment for that offense.

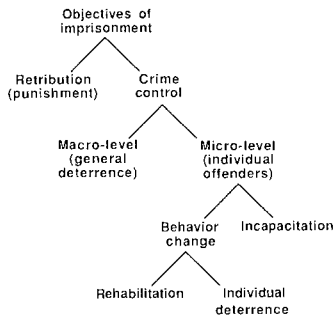
Although there had been some important classic statistical work examining crime in the 19th century by Quetelet (1) and criminal careers beginning in the 1930s by the Gluecks (2), it is only in recent years that we have seen significant new estimates of characteristics of criminal careers and new insights for policy relating to those careers. These are covered in some detail in a recent report by the Panel on Research on Criminal Careers of the National Research Council (3).

A significant factor inhibiting the growth of knowledge about criminal careers has been that traditional research focuses on developing correlates of crime, typically derived from cross-sectional studies of states or cities, looking for community characteristics that tend to be associated with high crime rates. Not surprisingly, many indicators of social deprivation are associated with crime, among them low income, high population density, and high minority racial composition (4). Knowing of such associations, however, is not very helpful. The strong mutual association among these correlates provides little guidance on their relative individual contributions to crime, and such partitioning is crucial in order to isolate and identify useful social investments to address these presumed causes. The traditional approach is also deficient because crime is dealt with as a unitary phenomenon without distinguishing the diverse ways in which causal factors might affect individual offenders. The criminal career paradigm partitions these effects into those that contribute to participation in crime and others that affect frequency of offending or that affect termination of a criminal career.

Research on criminal careers involves the characterization of the longitudinal pattern of crime events for offenders and assessment of the factors that affect that pattern. Use of the concept of a "career" is

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**Fig. 1.** Key decision points in policy choices on uses of imprisonment.

not meant to imply that crime need be the primary economic activity from which an offender derives a substantial part of his livelihood; it is merely a metaphor for the longitudinal process. It is also important to distinguish the concept of criminal careers from the policy-oriented reversal of that phrase, the “career criminal,” which refers to offenders whose criminal careers are of such serious dimension that they represent prime targets for the criminal justice system.

### Basic Structure of a Criminal Career

Examining the basic structure of criminal careers within any population involves first assessing the fraction that participates in crime and then, for that subset, developing information on the statistical properties of the parameters that characterize their criminal careers. “Participation” represents a primary filter between the general population and the subset who are criminally active. If crime is defined very broadly to include many minor infractions, participation in crime is virtually universal. However, as interest is focused more narrowly on serious offenses, participation becomes an important filter in distinguishing active offenders from nonoffenders. The intensity of criminal activity may vary considerably across these participants. “Frequency” refers to these individual crime rates, or the number of crimes per year committed by those who are active.

The basic identity linking the aggregate population crime rate,  $C$ , to the fraction participating,  $P$ , and their individual crime frequency,  $\lambda$ , is  $C = P\lambda$  when crime types and offender subgroups are treated homogeneously (5). In this identity, the crimes per year per capita ( $C$ ) is partitioned between participation,  $P$  (in terms of active criminals per capita), and frequency,  $\lambda$  (in terms of crimes per year per active criminal). This basic partition provides the opportunity to distinguish those factors that affect participation, which in general may be quite different from those that influence frequency by active offenders.

Among active offenders, three fundamental parameters represent the simplest characterization of a career structure: (i) age of initiation,  $A_0$ ; (ii) age at termination,  $A_N$ ; and (iii) mean number of crimes committed per year while active,  $\lambda$ . An important parameter of the criminal career is thus the career length represented by the interval  $T = A_N - A_0$ . Also at any point in the career,  $A_t$ , we are interested in the residual career length,  $T_R = A_N - A_t$ .

A simple configuration of a criminal career that invokes these basic parameters is shown in Fig. 2. Here the career begins at age  $A_0$  and the individual crime frequency rises immediately to  $\lambda$ , stays constant at that value for the duration of the career, and drops instantaneously to 0 at age  $A_N$  when the career is terminated. Obviously, variations on this basic structure are possible. There could be a finite rise time or termination period between the maximum crime frequency,  $\lambda$ , and 0. Over the course of an individual’s career,  $\lambda$  could fluctuate stochastically around his true underlying rate; in addition, there could well be variation in the true

underlying  $\lambda$  including the possibility of dropping to 0 for intermittent periods, and many other variations. All of these involve greater complexity and would require more elaborate assumptions.

### Estimation of Criminal Career Parameters

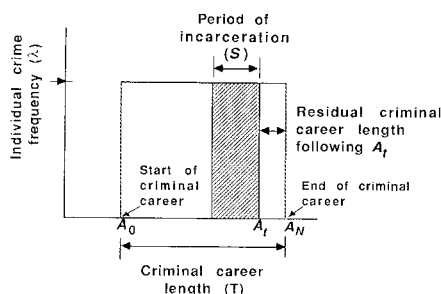
Estimation of criminal career parameters is particularly difficult because of the general invisibility of most crimes to any observer. An ideal observation method would involve a random sample of the population who would maintain a regular log of their criminal activities. The obvious fancifulness of such an approach requires a diversity of indirect approaches, relying on multiple data sources to develop estimates of the parameters.

A long-standing data source, which has now been available for over 40 years in the United States, is the Uniform Crime Reports (UCR). Published annually by the Federal Bureau of Investigation, the UCR is a compilation of monthly reports submitted to the FBI by individual police departments of the numbers of crimes reported to the police and the numbers of arrests, categorized by size of city and by demographic attributes (age, race, and sex) of the arrestees. The potential for bias in crime counts is clear, since fewer than half of the crimes experienced by victims are ever reported by them to the police (6), and this report percentage could well vary across jurisdictions (7). In addition, there could be variations across police departments in the criteria used to define a crime, or in efforts to manipulate the amount of crime reported to the FBI (8).

The UCR arrest data are particularly valuable because they provide some basic descriptive information about the offenders, and thus serve as a basis for distinguishing among them. Arrest statistics, however, are also subject to biases. In addition to reporting errors like those found in crime counts, arrest counts may be distorted by differential vulnerability to arrest (for example, more careful or more experienced offenders may be less likely to be arrested), or from differences in police discretion in issuing a warning as opposed to recording an arrest. Indeed, considerable criminological research energy has gone into a variety of efforts to demonstrate the possibility of these various biases in arrest data (9).

*Participation rates.* Most cross-sectional research on the correlates of crime reflects participation in crime. There are not many surprises among the variables associated with participation: low measured IQ, parental criminality, disruptive family situation, lower social class, low income, high unemployment, drug abuse, and others (10). One problem with this array of factors is the difficulty of identifying means of intervening in any of them in a significant and influential way. Even if one could influence one of these variables with regard to any particular individual, it is not clear how that would affect that individual’s propensity to become a participant in crime. Since the research relies primarily on cross-sectional data, it has not been adequately demonstrated that a change in the associated variable will necessarily change the consequences for an individual.

Participation rates,  $P$ , as well as rates of recidivism (rates of



**Fig. 2.** An individual criminal career (3).

recurrence of crime by offenders), can be estimated from a feedback model with first-time offenders as an exogenous forcing-function and with recidivists making up the feedback loop. The probability that an American male would be arrested some time in his life for a nontraffic offense has been estimated as 50 to 60% (11), a level of participation in crime that is probably an order of magnitude higher than most people would guess. In Great Britain, the lifetime conviction probability for males is estimated to be in the same range—44% (12).

These surprisingly high estimates might be dismissed because they include arrests for any kind of offense (other than traffic), and many people may be vulnerable to arrest for minor offenses like disorderly conduct. Subsequent estimates have focused more narrowly on only the FBI “index” offenses (murder, forcible rape, aggravated assault, robbery, burglary, larceny, and auto theft) that comprise the usual reports on “serious” crime published periodically by the FBI. Examining these data for the 55 largest cities (with populations over 250,000), the lifetime chance of an index arrest for a male in these cities was estimated to be 25%, with important differences between the races in their participation rates—the chances were 14% for whites and 50% for blacks (13). Further, excluding larceny arrests—relatively minor offenses (including shoplifting and theft of auto parts and bicycles) that account for 50% of all index arrests—does not significantly affect participation rates (13). The adjustment eliminates those individuals who were arrested only for larceny, and these are only a small fraction of those ever arrested for index offenses.

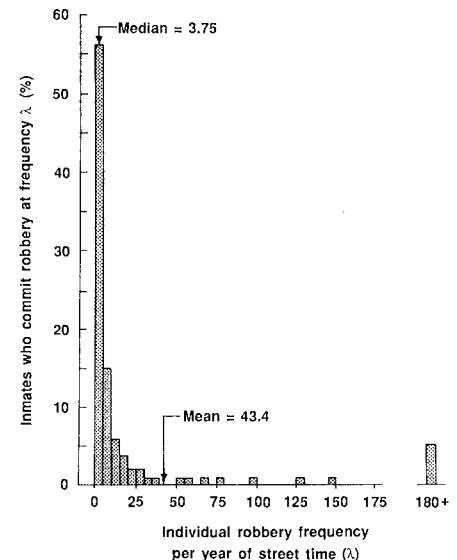
In sharp contrast to the large race difference in participation rates, the recidivism rates for serious crimes were about the same for blacks and for whites, about an 85 to 90% chance of rearrest for both groups (13). This highlighted an important substantive insight: whereas there appears to be an important difference in the degree to which individuals from the two groups became offenders, those who did become offenders in the two race groups appear much more similar in their offending patterns.

Of course, the policy implications of this are also very important: since the criminal justice system deals with people only after they have passed through the “participation filter,” that system has no direct interest in the factors that affect participation. Rather, their primary professional concern is with the factors that distinguish among those who do penetrate the “filter”—namely, the factors associated with active criminal careers. If race is not one of those factors, then racial discrimination by the criminal justice system, aside from being ethically wrong, is also empirically incorrect.

In research terms, the most important implication of these different results regarding race demonstrates the necessity to separate the determinants of participation from those of the criminal career for those who are active as offenders. In terms of the previous identity, we can now claim that  $C(x,y) = P(x)\lambda(y)$ , and the determinants of  $P$  and  $\lambda$  in variable sets  $x$  and  $y$ , respectively, could well be quite different. This thus motivates a search for the isolated set  $y$  that is of greatest interest to the criminal justice system.

*Crime frequency by active offenders.* Knowledge about the magnitude of  $\lambda$  in various populations is of particular interest in developing crime-control policies. The mean  $\lambda$  indicates the troublesomeness of any group of offenders, whereas the distribution over the group indicates the variation across individual offenders. For any fixed total crime rate, if the mean  $\lambda$  is high, then the total crime rate is attributable to a reasonably small number of offenders, and perhaps the crime problem might be significantly alleviated by isolating them. On the other hand, if the mean frequency is low with the same total crime rate, then the number of offenders is large and may well exceed the capacity of the criminal justice system, and it would be well to focus on other crime-control strategies, including strategies directed at reducing participation in offending.

**Fig. 3.** Distribution of robbery frequency among incoming inmates in California, Michigan, and Texas (3).

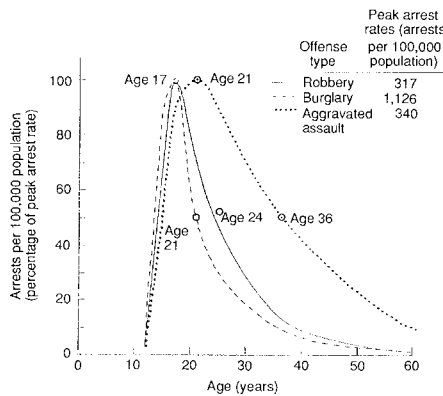


Some rather surprising results have emerged in studies of  $\lambda$ . Considerable diversity was found in estimates of  $\lambda$  based on inmates’ self-reports of the crimes they committed during the period just before the arrest leading to their current incarceration (14). Figure 3 highlights the highly skewed distribution of  $\lambda$  found among the inmates. For those who ever committed a robbery during the measurement period, half reported committing fewer than 4 robberies per year while they were free on the street, but 10% reported committing more than 70 robberies per year while free. Similarly for burglary, the median rate was 5 per year, but the 90th percentile claimed a rate of over 195 per year.

Estimates from official records are not likely to display such considerable diversity, largely because no offender is likely to experience a very large number of arrests. If we define  $\mu = \lambda q$ , where  $\mu$  is the individual arrest frequency (arrests per year while free for active offenders), and  $q$  is the probability of an arrest conditional on committing a crime, then an individual with a limited number of arrests can display a large value of  $\lambda$  only if he is extremely skillful or very lucky in evading arrest (so that  $q$  is very low). Official arrest records, however, do have some compensating virtues. They are reasonably complete, they provide detailed information on dates of arrest, and they do not suffer from the biases of nonresponse or intentional misrepresentation associated with self-reports. They can thus also be used to develop alternative estimates of  $\lambda$  for different populations.

With data drawn from computerized criminal history files maintained by the FBI, longitudinal arrest histories were obtained for all adults arrested for murder, rape, robbery, aggravated assault, burglary, or auto theft in Washington, D.C., during 1973, or in the Detroit Standard Metropolitan Statistical Area (SMSA) during the period 1974 to 1977 (15, 16). The arrest histories included information on any arrests as adults occurring before or during the sampling years for sampled individuals, as well as dispositions in court and dates of admission or release from correctional institutions.

Adult arrestees for serious offenses were almost exclusively male ( $\geq 90\%$ ) in both sites. The two populations differed markedly with respect to race. The Washington, D.C., arrestees, who reflected the racial composition of that city in the early 1970s (71% black in the 1970 census), included 92% nonwhites. The arrestees from the Detroit SMSA, which included the suburban counties surrounding Detroit, included 43% nonwhites, a figure that much more closely resembles the racial composition found nationally (45% nonwhite) among urban arrestees for serious offenses (17).



**Fig. 4.** U.S. age-specific arrest rates (arrests per 100,000 population of each age) for 1983. The curve for each offense type is displayed as a percentage of the peak arrest rate. The curves show the age at which the peak occurs (at 100%) and the age at which the peak falls to 50% of the peak rate (3).

The arrestee populations in both study sites numbered several thousand—5,338 in Washington, D.C.; 10,588 whites and 8,022 blacks in the Detroit SMSA. The analyses of frequencies,  $\lambda$ , however, focused on selected cohorts of about 150 arrestees active in a crime type within these annual cross-sections. Cohort subsamples permit analysis of changes in  $\lambda$  over time for the same arrestees. Examination of changes in  $\lambda$  with age in the histories of the full sampling cross section, for example, includes different subsets of arrestees at different ages. Estimates at age 20 are based on a broad cross section of offenders, some who were age 20 many years ago but most of whom were near age 20 at the time of sampling because most arrestees are young (see Fig. 4). In contrast,  $\lambda$  estimates at older ages, say 35, are based on individuals who are 35 or older at the time of sampling; arrestees who were younger at the time of sampling cannot be observed at these older ages. Thus the estimates at older ages are dominated by individuals who grew up at an earlier time and also who persisted in their criminal careers for a long time. Analyses of age differences in cross-sectional data—even longitudinal data for the cross-section sample—thus result in different sample compositions at each age, thereby confounding changes over age with possible cohort effects and historical period changes.

Cohorts included those arrestees who reached age 18 in the same year and whose first arrest as adults occurred at ages 18 to 20, thereby ensuring that they were active in criminal careers as adults before age 21. The resulting  $\lambda$  estimates were thus based on the arrest experiences of offenders who had at least two arrests, one in the sampling year and another earlier in their careers at age 18, 19, or 20. This restriction, combined with the further requirement that the arrest in the sampling year be for a serious offense, limits the analysis to frequency rates for reasonably serious adult arrestees who were presumably criminally active throughout the estimation interval.

Individual annual arrest frequencies,  $\mu$ , were estimated for the cohorts in Washington, D.C., and in the Detroit SMSA. The required arrests at either end of the estimation period were excluded, and time spent incarcerated was excluded from the time at risk of arrest in the estimation period. The mean frequencies estimated for adult arrestees who were in their 20s between 1966 and 1973 (18) are reported for the two jurisdictions in Table 1 (15, 17). When not incarcerated, arrestees active in robbery, burglary, or larceny are arrested about once every 4 years for these crime types; mean inter-arrest intervals are longer for aggravated assault (5 years) and auto theft (7 years).

These  $\mu$  estimates can be used to develop estimates of  $\lambda$  that include the many more crimes committed that do not result in arrest. If the  $q$  is independent of  $\lambda$ , then  $\mu = \lambda q$ . The ratio of police statistics on reported arrests,  $A$ , divided by reported crimes,  $R$ , represents a starting point for estimating the offense-specific probability of arrest per crime. This simple ratio is adjusted by the offense-specific rate at which victims report crimes to the police,  $r$ , to

account for unreported crimes among total crimes committed. Another offense-specific adjustment is made to account for the average number of multiple offenders arrested for the same crime incident,  $O$  (15).

From the relationship  $q = (A/O)/(R/r)$ , for each crime type, an average probability of arrest per crime for the different offenses is reported in Table 1. These estimates are generally under 0.05 (15, 17). The somewhat higher value for aggravated assault probably reflects the direct confrontation between offender and victim, and the high proportion of offenders who are known to victims, 36.5% in 1980 (19). These estimates of  $q$  based on aggregate published data are similar to other estimates of  $q$  based on self-reports of arrests and crimes by prison inmates (20, 21).

Within any crime type and jurisdiction, the average  $\lambda$  in Table 1 is estimated from  $\mu/q$ , applying  $q$  uniformly to all active arrestees. Subsequent analyses of variations in  $q$  among offenders suggest a negative relation between  $q$  and  $\lambda$ , particularly with the highest frequency offenders subject to lower arrest risks per crime (22). This relation implies that the estimates of  $\lambda$  in Table 1 are understated. The analysis of  $q$  for individuals, however, did not find systematic variations in  $q$  with other factors examined—jurisdiction, age, race, or prior arrests—and so patterns of differences in  $\lambda$  with these factors are not likely to be distorted (22).

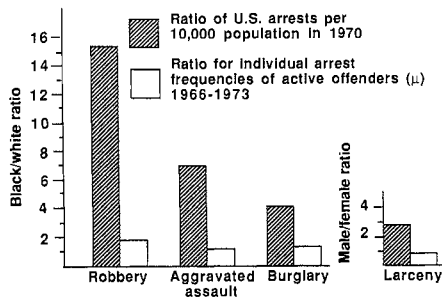
Mean  $\lambda$  estimates in the two sites were generally similar in magnitude for most offense types. Individual frequencies were lowest for offenses involving actual or threatened violence. Arrestees active in aggravated assault were estimated to commit an average of two to three of these crimes annually, and offenders active in robbery were estimated to commit an average of three to five robberies per year while free. Individual frequencies for property crimes were generally higher, at more than five per year. The largest difference in  $\lambda$  was found for auto theft;  $\lambda$ , on average, was three auto thefts per year in Washington, D.C., compared to nine in the Detroit SMSA, perhaps attributable to differences between the jurisdictions in the availability of crime targets (23).

It is particularly interesting to compare estimates of the race-specific arrest rates (on a per-capita basis in the general population) with the corresponding values of  $\mu$  for active offenders only, as in Table 2 and Fig. 5. We see here that, even though the ratios of black-to-white arrest rates in the general population are high (15 for robbery, 7 for aggravated assault, and 4 for burglary), the ratio of the values of  $\mu$  are much closer to unity. A similar situation is shown in Table 3 and Fig. 5 when sex-specific rates for larceny are compared: male-to-female ratios of 2.5 in aggregate arrest rates are associated with  $\mu$  ratios that are again close to unity.

The relationship of  $\mu$  with age is also surprising when the effects of  $\mu$  are separated from those of  $P$ . The typical information suggesting very sharp age differences in involvement in crime is given by age-specific arrest rates in the general population (where the age effect on crime is inferred from the ages of arrestees), as

**Table 1.** Mean individual arrest frequencies ( $\mu$ ) from official arrest histories, probabilities of arrest per crime ( $q$ ), and associated estimates of mean individual crime frequencies ( $\lambda$ ), 1966–1973.

Offense type	Washington, D.C.			Detroit SMSA		
	$\mu$	$q$	$\lambda$	$\mu$	$q$	$\lambda$
Robbery	0.23	0.069	3.3	0.20	0.043	4.7
Aggravated assault	0.19	0.111	1.7	0.18	0.062	2.9
Burglary	0.26	0.049	5.3	0.20	0.038	5.3
Larceny	0.27	0.026	10.4	0.22	0.030	7.3
Auto theft	0.14	0.047	3.0	0.14	0.015	9.3



**Fig. 5.** Race and sex ratios for arrest rates (arrests per 10,000 population) and individual arrest frequencies,  $\mu$ , for active offenders. [From data in (3)]

shown in Fig. 4. Many presume that this pattern of a rapid rise to a peak in the late teens, followed by a steady decline at older ages, must also apply to the age-specific pattern of  $\mu$ . Empirically, however,  $\mu$ 's for individual crime types are much less sensitive to age: when average  $\mu$ 's are compared, none of the expected large declines with age are observed for cohorts of arrestees during their 20s (15).

Arrest frequencies for active offenders are thus found to be much more similar across different demographic groups than are aggregate arrest rates. This suggests, of course, that the considerable variability in population arrest rates with demographic variables is attributable predominantly to differences in  $P$  with these variables. This reflects higher participation in crime by males and by blacks, and a rapid buildup of participation in the early teen years, followed by steady termination of criminal careers in the later teen years and early 20s. For those offenders who remain active, however, the value of  $\mu$  seems to be fairly constant over age and across race and sex.

It is striking how few variables have yet been identified as significantly influencing  $\lambda$ . One of the important ones is the frequency and intensity of drug use. During periods of heavy drug use offenders commit crimes at frequencies six times as high as nonusing offenders (3, pp. 74-75).

*Duration of criminal careers.* Aside from the frequencies, the second most important parameter describing the criminal career is career length, and particularly the related residual career length. These are difficult to observe directly, partly because of the difficulty of determining just when the career is actually terminated. We have addressed this issue by using methods similar to those in life-table analysis (24).

In this approach, if there are significantly fewer 30-year-olds than 25-year-olds among active offenders, then one explanation for that decline is career termination between ages 25 and 30. Obviously, other competing explanations include differences in the sizes of the age cohorts in the general population, different rates of recruitment into criminal activity across the different cohorts, differential imprisonment with age, and decreases in  $\lambda$  with age. Controlling for these alternative explanations, Blumstein and Cohen (25) develop estimates of termination rates and of their reciprocal, the mean residual career length, as a function of age. These estimates are shown in Fig. 6 for offenders whose adult careers began before age 21.

Conventional wisdom about criminal career termination is unduly influenced by examination of Fig. 4. In that figure, it is apparent that by age 30 there is a sharp decline in the number of active offenders. Thus, common belief suggests that offenders are about to terminate their criminal careers by age 30, so that long sentences for such offenders would be particularly wasteful of prison resources. From Fig. 6, however, it becomes clear that among those offenders who do remain active, mean residual career length actually rises until about age 30, is fairly flat through the 30s, and then begins to decline rapidly in the early 40s.

This process is similar to many other lifetime phenomena that are characterized by high failure early in life (infant mortality, break-in failures of machines), maximum expected lifetime in the middle, and

high failure again at the end (aging, wear-out failures in machines). Because a large number of offenders do terminate their careers quickly during the early break-in period, adult careers are reasonably short, averaging under 6 years for serious offenses. Relatively few offenders survive these early high termination rates and remain active in criminal careers into their 30s, but they are the ones with the most enduring careers. Termination rates do begin to increase at older ages, but that does not occur until after age 40.

It is interesting to speculate on those factors that might be contributing to the high termination rates in the later years. They could be attributable to increased mortality, but the career termination rates, in the order of 15% per year, are a factor of more than 10 higher than ordinary mortality rates for males of under 1.5% at ages 45 to 54 (26). Of course, the population of individuals who are still active offenders in their 40s may be subject to higher death rates than those of the general population. Indeed, death rates among parolees are two to three times as high as general population rates (25). This difference in mortality rates, however, is not sufficient to fully explain the higher termination rates that are observed. Another possible explanation could be associated with the kind of physiological effects one sees in many other facets of young male activity (for example, athletics) with peaking in the early ages followed by a gradual decline and then a rapid decline at later ages.

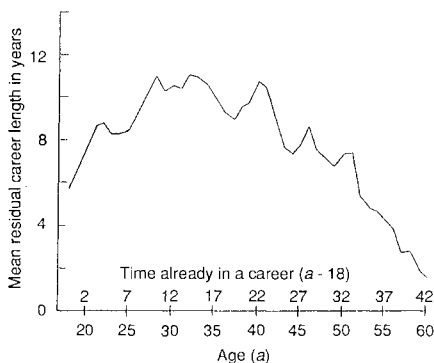
## Policy Implications of Emerging Criminal-Career Knowledge

Although much of the research on criminal careers is still embryonic and not yet ready for significant policy application, some of the emerging insights represent important challenges to the prevailing conventional wisdom about crime and about means for dealing with crime.

*Prevention.* Obviously, the most attractive policy approach involves a search for means of preventing individuals' involvement in crime in the first place. Most of the available knowledge of factors associated with crime—including social class, family situation, age, employment, and drug use—are appropriate concerns here. Of course, the great majority of these represent various forms of social disability that should be addressed regardless of their role in fostering crime. These factors are sufficiently strongly intercorrelated with each other that isolating the effect of any one of them is extremely difficult both analytically and empirically. This makes it particularly difficult to assess the effect of manipulation of any single one of those variables. The strong interdependence of various social disabilities is no doubt a factor in the general failure to find evidence of demonstrable effects for programs directed at alleviating one or another of these disabilities (27).

**Table 2.** Race-specific population arrest rates and mean individual arrest frequencies ( $\mu$ ) for active offenders (3).

Race	Race-specific rates		
	Robbery	Aggravated assault	Burglary
<i>U.S. arrests per 10,000 population</i>			
Whites			
1970	1.84	4.55	12.93
1980	3.09	8.84	18.33
Blacks			
1970	28.22	31.51	53.37
1980	31.74	37.49	56.00
<i><math>\mu</math>, Detroit SMSA 1974-1977</i>			
Whites	0.13	0.18	0.18
Blacks	0.23	0.18	0.22



**Fig. 6.** Variation in mean residual career length ( $T_R$ ) with time already in a career for 18- to 20-year-old starters (25).

**Incapacitation.** The mechanism of crime control which is most directly related to criminal careers is incapacitation. Incapacitation refers to the crimes averted in the community by removing an offender who would otherwise be active in a criminal career. Those crimes are averted only if the crimes “leave the street” with the offender’s removal. To the extent that crimes derive from an economic market—as is the case with drug sales, for example—then removing a single supplier is not likely to affect the market in any significant way because a replacement supplier is likely to appear to meet the continuing demand. Even burglaries that are carried out in the service of a fence, for example, could simply be continued by the fence finding new recruits to replace an imprisoned burglar. Continued offending by criminal groups after the incarceration of some group members also decrease incapacitation effects (28).

Crimes that are carried out without such obvious structural sources, but which are linked more to the personal circumstances of individual offenders, and particularly acts of personal violence, are much more likely to be averted through incapacitation. For such crimes, in the context of the simple criminal-career structure indicated in Fig. 2, a sentence of  $S$  years served between  $A_0$  and  $A_N$  should avert  $\lambda S$  crimes.

It is possible, however, that the sentence is imposed later in the criminal career so that the time served extends after the career would have been terminated anyway at  $A_N$ . In that case the period between the end of the career ( $A_N$ ) and the end of the sentence is “wasted” in terms of incapacitative effects. Obviously, if the judge could anticipate when the career would be terminated, he could take account of that in his sentence. The stochastic quality of the termination process, however, limits his ability to make that prediction.

Avi-Itzhak and Shinnar (29) developed a model to estimate the incapacitative effects of a sentence with mean length  $S$  for an individual who commits crime at a Poisson rate  $\lambda$ , with a probability of arrest  $q$  and a conditional probability of incarceration after arrest  $J$ . The mean time between crimes while active and free on the street is  $1/\lambda$ ; the mean street time between arrests is  $1/\lambda q$ ; the mean street time between incarcerations is  $1/\lambda q J$ ; and so in cycles between spells of imprisonment, the fraction of time spent in prison is  $S/(S + 1/\lambda q J)$ . This is the fraction of the career that is spent in prison  $I = (\lambda q J S)/(1 + \lambda q J S)$ .

This model forms the basis for several recent estimates of incapacitative effects (30–33). The model assumes a Poisson crime committing process, an exponential distribution of time in prison, infinite career length, and values of each of the parameters independent of each other. Although those assumptions are highly simplified, the results are reasonably robust to most minor violations. The failure to account for finite career length, however, and the resulting loss in incapacitative effect when time is served after careers have terminated can be considerable. That effect is accommodated by replacing  $S$  in the last equation with  $ST/(T + S)$  when career length is exponentially distributed with finite mean  $T$ . If careers are long compared to

sentence length, finite career length would not have much effect. For careers that average 5 to 10 years and time served averaging 2 to 3 years, however, that effect can be significant (3, 34).

**Rehabilitation.** Incapacitation effects represent crime reduction that occurs while the individual is incarcerated. The incarceration experience, however, could also have longer term effects following release if it changes behavior, either through individual deterrence or through enhancing skills in functioning in legitimate activity. That effect might show itself through a reduction in  $\lambda$  or shortening of the residual criminal career. The effects of incarceration, however, could be criminogenic and work in the opposite direction by lengthening the criminal career or increasing  $\lambda$ . Research on rehabilitation suggests that the net effects for a variety of identified and evaluated treatment programs both in and out of prison, are generally small (35, 36). It is possible, then, that some offenders undergo rehabilitation, while others suffer a criminogenic effect of incarceration, but that in aggregate the two are roughly in balance. Distinguishing the features of criminal careers that are amenable to rehabilitative treatment from those that are not may provide a means of reducing crime through rehabilitation. Although the search is important, programs that are demonstrably effective in this regard have not yet been identified.

**General deterrence.** General deterrence is the crime reduction achieved through the symbolic threat communicated to others by the sanctions imposed on identified offenders. These effects have been widely explored but there are still no definitive estimates of the magnitudes of those effects (37, 38). Research on deterrent effects most commonly relies on cross-sectional studies to determine the effect on aggregate population crime rates of sanction variations across jurisdictions. More fruitful results might be obtained by focusing deterrence research on the various aspects of criminal careers, and examining the separate deterrent effects of sanction threats on rates of initiation into criminal careers, on crime frequencies by active offenders, and on rates of termination.

## Some Summary Issues

**The issue of race.** One of the important insights on crime that results from the research on criminal careers is the isolation of the role of the race variable. General population arrest rates are very different between blacks and whites, and especially so for violent crimes. This difference is due primarily to large race differences in participation, with very little difference between the races in the crime frequency of active offenders. Since the cases seen by the criminal justice system have already penetrated the participation filter, where race differences are large, this argues strongly that racial discrimination in arrest, sentencing, or parole decisions, which is unambiguously prohibited on normative grounds, is also empirically wrong as a basis for decisions about active offenders.

**The role of drug use.** The important influence of heavy drug use on  $\lambda$  is consistent with conventional wisdom, which suggests that drug users without other economic sources of support resort to other

**Table 3.** Sex-specific population arrest rates and mean individual arrest frequencies ( $\mu$ ) for active offenders (3).

Year	Males	Females
<i>U.S. arrests for larceny per 10,000 population</i>		
1970	54.30	19.98
1980	76.91	29.60
<i><math>\mu</math> for larceny in Albany and Erie counties, New York</i>		
1972–1976	0.16	0.18

forms of crime to obtain the resources for their drug use. This has led some observers to argue that reduced enforcement, possibly even decriminalization, would lower the price and thereby diminish the need for crime to finance the purchase of drugs. Of course, this fails to account for any influence of higher price on inhibiting initiation or diminishing use by those who are current users.

Recognition of the relation between drug use and  $\lambda$  has also been used to argue for stricter enforcement against all drug offenses. Such a policy, however, fails to distinguish between drug users who engage primarily in drug offenses and those who engage in more threatening predatory crimes like robbery and burglary. To the extent that drug offenders are otherwise economically self-sufficient (for example, by earning considerable income from legitimate employment or by selling drugs to other users) a crackdown on their drug offenses will not affect predatory crimes directly. The strong association between drug use and  $\lambda$  for nondrug offenses, however, does suggest that, at least from the viewpoint of incapacitative effectiveness, the fact that a robber or other predatory offender uses drugs intensively should be viewed as an aggravating factor that would warrant a more certain sentence. Such a policy is contrary to the common practice of viewing drug involvement in the commission of a crime as a mitigating factor in establishing the sentence, largely because of concern over the diminished capacity—and the associated reduction in blameworthiness—of individuals under the influence of drugs.

*Older criminals.* The results here also suggest reconsideration of the conventional views about offenders who remain active in criminal careers into their 30s. After the teenage years, age certainly appears to be monotonically negatively related to  $P$ , that is, there is reasonably high termination and relatively little recruitment after about age 20, and so participation levels continue to decline. However, the common belief that offenders who remain in their criminal careers into their 30s will imminently terminate their careers is not empirically justified. On the contrary, those offenders who are still actively involved in crime at age 30 have survived the more typical early termination of criminal careers, and so are more likely to be the more persistent offenders. After their early 40s, however, their termination rates are quite high.

It is clear from the existing research that the microperspective of examining individual criminal careers does indeed provide the opportunity for significant new insights that are not otherwise available from examination of aggregate data regarding crime rates. It is also clear that the issues are quite complex and the causal connections are often elusive. Prospective longitudinal research on a large sample of individuals from multiple cohorts relying on official-record data and repeated self-reports of criminal activity and individual life events, would provide more precise indications of causal sequences. More effectively disentangling the apparent drug-crime nexus is of particular concern. The greatly enriched data on changes in life circumstances would also provide an expanded basis for identifying some of the factors most strongly associated with high and low crime frequencies and with early and late career terminations—aspects of criminal careers that bear directly on the effectiveness of various crime-control strategies.

#### REFERENCES AND NOTES

1. A. Quetelet, *Research on the Propensity for Crime at Different Ages* (Hayez, Brussels, 1831), in French; English translation by S. F. Sylvester (Anderson, Cincinnati, 1984).
2. S. Glueck and E. T. Glueck, *500 Criminal Careers* (Knopf, New York, 1930); *One*

- Thousand Juvenile Delinquents* (Harvard Univ. Press, Cambridge, MA, 1934); *Later Criminal Careers* (Commonwealth Fund, New York, 1937); *Juvenile Delinquents Grown Up* (Commonwealth Fund, New York, 1940); *Criminal Careers in Retrospect* (Commonwealth Fund, New York, 1943); *Unraveling Juvenile Delinquency* (Harvard Univ. Press, Cambridge, MA, 1950); *Delinquents and Nondelinquents in Perspective* (Harvard Univ. Press, Cambridge, MA, 1968).
3. A. Blumstein, J. Cohen, J. Roth, C. A. Visher, Eds., *Criminal Careers and "Career Criminals,"* National Research Council (National Academy Press, Washington, DC, 1986), vol. 1.
4. For overviews of research on the relation of community attributes and crime, as well as more recent developments in ecological studies, see A. J. Reiss, Jr., and M. Tonry, Eds., *Communities and Crime* (Univ. of Chicago Press, Chicago, 1986); and J. Byrne and R. J. Sampson, Eds., *The Social Ecology of Crime* (Springer-Verlag, New York, 1986).
5. For the heterogeneous case, with crimes of type  $i$  and offenders of group  $j$ , the relation becomes  $C_i = \sum_j n_j P_{ij} \lambda_j / \sum_j p_j$ ;  $C = \sum_i C_i$ .
6. Bureau of Justice Statistics, *Criminal Victimization 1985* (U.S. Department of Justice, Washington, DC, 1986).
7. D. Black, *Am. Sociol. Rev.* 35, 733 (1970); M. J. Hindelang, *Criminal Victimization in Eight American Cities* (Ballinger, Cambridge, MA, 1976).
8. W. G. Skogan, *Soc. Sci. Q.* 55, 25 (1974).
9. See M. J. Hindelang [*Am. Sociol. Rev.* 43, 93 (1978)] for an overview of research on the determinants of arrest. More recent developments are available in D. A. Smith [in *Communities and Crime*, A. J. Reiss, Jr., and M. Tonry, Eds. (Univ. of Chicago Press, Chicago, 1986), pp. 313–341].
10. These factors are associated with the ordinary victim crimes that are of most common concern, that are reported regularly by the police, and that fill news stories. Factors associated with white-collar crime and regulatory crime are likely to be very different, since access to opportunities to commit such crimes is limited to different social groups.
11. R. Christiansen, in *Task Force Report: Science and Technology* (Government Printing Office, Washington, DC, 1967), p. 216; J. Belkin, A. Blumstein, W. Glass, *J. Crim. Justice* 1, 7 (1973).
12. D. P. Farrington, *Br. J. Criminol.* 21, 173 (1981).
13. A. Blumstein and E. Graddy, *Law Soc. Rev.* 16, 265 (1982).
14. J. Chaiken and M. Chaiken, *Varieties of Criminal Behavior* (Rand Corporation, Santa Monica, CA, 1982).
15. A. Blumstein and J. Cohen, *J. Crim. Law Criminol.* 70, 561 (1979).
16. J. Cohen, in *Crime and Justice*, M. Tonry and N. Morris, Eds. (Univ. of Chicago Press, Chicago, 1983), vol. 5, p. 1.
17. J. Cohen, in (3), p. 292.
18. The populations sampled were arrested in the mid-1970s. This raises a question about the direct applicability of these results to samples that might be drawn today. Such replication is clearly desirable.
19. Bureau of Justice Statistics, *Criminal Victimization in the United States, 1980* (U.S. Department of Justice, Washington, DC, 1982).
20. M. A. Peterson, H. B. Braiker, S. Polich, *Who Commits Crimes* (Oelgeschlager, Gunn, Hain, Cambridge, MA, 1981).
21. J. Petersilia, *Racial Disparities in the Criminal Justice System* (Rand Corporation, Santa Monica, CA, 1983).
22. A. Blumstein, J. Cohen, C. A. Visher, in preparation.
23. R. F. Sparks, in *Indicators of Crime and Criminal Justice: Quantitative Studies*, S. E. Fienberg and A. J. Reiss, Jr., Eds. (U.S. Department of Justice, Washington, DC, 1980), p. 18.
24. D. R. Cox, *Renewal Theory* (Methuen, London, 1962).
25. A. Blumstein and J. Cohen, in preparation.
26. U.S. Bureau of Census, *Statistical Abstract of the U.S. 1985* (U.S. Department of Commerce, Washington, DC, 1984), p. 71.
27. R. J. Lundman, P. T. McFarlane, F. R. Scarpitti, *Crime Delinquency* 22, 297 (1976); W. E. Wright and M. C. Dixon, *J. Res. Crime Delinquency* 14, 35 (1977); D. P. Farrington, L. E. Ohlin, J. Q. Wilson, *Understanding and Controlling Crime: Toward a New Research Strategy* (Springer-Verlag, New York, 1986).
28. A. J. Reiss, Jr., in (3), vol. 2, p. 121.
29. B. Avi-Itzhak and R. Shinnar, *J. Crim. Justice* 1, 185 (1973).
30. R. Shinnar and S. Shinnar, *Law Soc. Rev.* 9, 581 (1975).
31. J. Cohen, in (38), p. 187.
32. P. W. Greenwood, *Selective Incapacitation* (Rand Corporation, Santa Monica, CA, 1982).
33. M. Moore, S. R. Estrich, D. McGillis, W. Spelman, *Dangerous Offender: The Elusive Target of Justice* (Harvard Univ. Press, Cambridge, MA, 1984).
34. J. Cohen, in preparation.
35. D. Lipton, R. Martinson, J. Wilks, *The Effectiveness of Correctional Treatment: A Survey of Treatment Evaluation Studies* (Praeger, New York, 1975).
36. L. Sechrest, S. O. White, E. Brown, Eds., *The Rehabilitation of Criminal Offenders: Problems and Prospects* (National Academy of Sciences, Washington, DC, 1979).
37. D. Nagin, in (38), p. 95.
38. A. Blumstein, J. Cohen, D. Nagin, Eds., *Deterrence and Incapacitation: Estimating the Effects of Criminal Sanctions on Crime Rates* (National Academy of Sciences, Washington, DC, 1978).
39. Supported in part by grants 79-NI-AX-0121 and 82-IJ-CX-0062 from the National Institute of Justice.