LIFE-COURSE DESISTERS? TRAJECTORIES OF CRIME AMONG DELINQUENT BOYS FOLLOWED TO AGE 70*

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Linking recently collected data to form what is arguably the longest longitudinal study of crime to date, this paper examines trajectories of offending over the life course of delinquent boys followed from ages 7 to 70. We assess whether there is a distinct offender group whose rates of crime remain stable with increasing age, and whether individual differences, childhood characteristics, and family background can foretell long-term trajectories of offending. On both counts, our results come back negative. Crime declines with age sooner or later for all offender groups, whether identified prospectively according to a multitude of childhood and adolescent risk factors, or retrospectively based on latent-class models of trajectories. We conclude that desistance processes are at work even among active offenders and predicted life-course persisters, and that childhood prognoses account poorly for long-term trajectories of offending.

KEYWORDS: Age and crime, trajectories, desistance, typologies, prediction.

Sharply divergent portraits of the developmental course of crime characterize the current scene. From proponents of the criminal career approach, the idea has proliferated that chronic offenders are a distinct group that, as the adjective implies, do not desist from crime (Blumstein and Cohen, 1979; Blumstein et al., 1986; see also Piquero et al., 2003). A variation on this theme comes from Moffitt (1993, 1994), who argues that a group of life-course persisters continue offending at a high rate, like

* Earlier versions of this paper were presented to the American Sociological Association (Washington, D.C.), the Life History Research Society (Kauai, Hawaii), the Life-Course Symposium and the Population Research Center Colloquium at the University of Maryland, and the Demography Workshop at the University of Chicago. We thank participants in all of these venues, along with the anonymous reviewers of *Criminology*, for constructive criticisms. Elaine Eggleston provided superb research assistance, and the Russell Sage Foundation and the Center for Advanced Study in the Behavioral Sciences provided partial funding support.

chronic offenders, as they age. In direct contrast, Gottfredson and Hirschi (1986, 1990) contend the age effect is invariant—that regardless of stable between-individual differences, all offenders will commit fewer crimes as they age.

Unfortunately, longitudinal research efforts to resolve the age-crime and "offender group" question suffer three major limitations: 1) criminal careers are typically studied over circumscribed portions of the life course, 2) trajectories of crime are usually identified *retrospectively*, based on the outcome, rather than *prospectively*, based on the causal factors presumed to differentiate groups of offenders, and 3) incapacitation and death are typically not accounted for in estimating desistance. Post-hoc typologies of offenders are thus ubiquitous in criminology; prospective categorization of risk typologies and valid criminal trajectories over the long run that would support or invalidate them are not. This is understandable, for long-term studies that follow the same individuals over time are as rare as they are difficult to carry out.

We address these limitations directly by analyzing newly collected data on crime during each year from childhood up to age 70 among a group of 500 men with troubled backgrounds. Committed to reform schools in Massachusetts during their adolescence in the 1940s, these 500 men were the original subjects of the now-classic study by Sheldon and Eleanor Glueck (1950). Followed to age 32 by the Gluecks (1968), the early and young-adult lives of these men were also investigated by Sampson and Laub (1993). The present study entails a 35-year follow-up of the same men that includes detailed searches of crime and mortality records up to age 70. One of the major strengths of our study is thus its ability to examine within-individual variability over nearly the entire life course—data on crime from age 7 to 70 for a relatively large group of individuals simply do not exist elsewhere. Moreover, the Gluecks' (1950) original design in *Unraveling Juvenile Delinquency* targeted serious, persistent delinquents in adolescence, providing an important opportunity to assess patterns of continuity and change in crime for a population of high interest and concern to policy efforts that target "high-risk" children.

Our analytical strategy begins with a detailed examination of within-individual trajectories of age and crime in the lives of the Glueck men from childhood to old age. After assessing basic facts as they bear on the age-crime debate in our data (e.g., patterns of onset, frequency, termination), we then turn to trajectories of crime in connection with prospectively and theoretically defined taxonomies based on early risk factors. We next take the opposite tack by defining offending trajectories retrospectively, or ex-post, on the basis of patterns of offending observed over the full life course, and then assessing their predictability from childhood and adolescent risk factors. This dual analytic approach allows us to shed

new light on prevailing theories that rest fundamentally on the idea of distinct and predictable groups of offenders.

TYPOLOGICAL APPROACHES: THE NEW CONTROVERSY?

Before the 1980s, criminological research tended to focus on between-individual correlates of crime (e.g., what factors distinguish offenders from nonoffenders?) and concerns about measuring these correlates using official versus self-report data. The criminal career debate ushered in a new era, most notably, the claim that one must distinguish elements of offending (onset, escalation, persistence, and desistance) within the population of offenders (Blumstein et al., 1986; cf. Gottfredson and Hirschi, 1986). Although the question of whether the aggregate age-crime relationship is invariant has generated most of the controversy, we see the debate as a much larger one—how should the field of criminology conceptualize its dependent variable?

Over the last decade, a similar fundamental challenge has arisen in the field of criminology, although it has not been fully recognized as such. This challenge comes from developmental criminologists promoting the idea of offender types (e.g., Loeber and LeBlanc, 1990; Moffitt, 1993; Patterson and Yoerger, 1993). These researchers extend the criminal career position one step further by arguing the existence of distinctive groups of offenders as defined by criminal trajectories, with each group possessing a distinctive developmental etiology. Put differently, developmental researchers claim different factors at different points (or ages) in the life course lead to different offending trajectories and ultimately distinct groups of offenders. Moffitt's (1993, 1994) theory of a dual taxonomy focusing on life-course-persistent and adolescence-limited offenders is the leading example of this approach. As in the earlier debate on criminal career research, in effect, this position stakes out a claim for the correct conceptualization of the dependent variable in criminological research.

Digging a bit more deeply, one finds a largely unrecognized background to this kind of typological thinking in the history of criminology. According to Don Gibbons, the core assumption of typological approaches is that a number of distinct types or groups of offenses or offenders exist that can be identified and studied (1985:152). This turns out to be a very old idea in criminology going back to the days of Cesare Lombroso's (1912) notion of an atavistic type. Over the last century, some criminologists have taken a more nuanced approach, most commonly with a focus on types of offenses (Clinard and Quinney, 1973). Other criminologists have taken a person-centered or offender-centered approach and focused on the types of criminal or delinquent persons (Roebuck, 1966). Typological

approaches promise a great deal, for as Gibbons has noted, if distinct groupings of offenders and offending exist, "explanations or causal analysis probably requires that we develop separate etiological accounts for each of the forms of lawbreaking or kinds of lawbreakers" (1985:153). Second, and more pragmatically, if different causal processes produce distinct groupings, then we will be better positioned to apply interventions matching the person-type and the crime.

It is hard to overestimate the appeal of typological thinking in criminology. Consider the reappearing recidivist offender. Over 70 years ago, the Gluecks found that virtually all of the 510 reformatory inmates in their study of criminal careers had backgrounds in serious antisocial conduct. Their data were thought to confirm "the early genesis of antisocial careers" (1930:143), a finding that has reverberated throughout criminology ever since. For example, one of the most consistent claims in criminological research is that adults with the highest rate of offending have a tendency to begin their involvement in crime at earlier ages than offenders with shorter careers and fewer offenses. A related but modern example of considerable import was that a small proportion of chronic offenders account for the majority of crime incidents (Wolfgang et al., 1972). In their famous analysis of the Philadelphia Birth Cohort data, Wolfgang and associates reported that 6% of the subjects (or 18% of the delinquents) accounted for nearly 52% of the crimes committed by this cohort. Wolfgang et al. (1972) also found that chronic offenders were more likely than nonchronic offenders to be nonwhite, come from a lower socioeconomic background, experience more family moves, have lower IQs, have fewer school grades completed, exhibit more school discipline problems, commit more serious offenses, and begin criminal careers early in the life course as measured by age of first arrest. Similar results were soon reported elsewhere in the United States and abroad. Heavily influenced by the pioneering Philadelphia cohort study, criminological inquiry turned its attention ever since to the subset of chronic offenders known as serious, violent offenders. The idea that there is a distinct group of such offenders that can be distinguished by early life predictors became one of the hallmarks of the criminal career approach (Blumstein et al., 1986).

One of the most influential typological accounts of crime was recently offered by Moffitt (1993, 1994). She posits two distinct categories of individuals, each possessing a unique natural history of antisocial behavior over the life course—*Life-Course-Persistent* and *Adolescence-Limited* offenders. Moffitt (1993:695) explicitly argues that life-course persisters have etiological roots traced to childhood risk factors such as difficult temperament, low verbal IQ, and poor self-control. The specific prediction is of distinct developmental trajectories, in her case, two groups of offenders, one of whose lineage (the persisters) is rooted in preexisting differences in

childhood and early adolescence. Life-course persisters, although small in number, do enormous damage because they account for the lion's share of adult misconduct. The fundamental point is that the two groups are qualitatively distinct, with the life-course persisters starting early and, as the name implies, persisting through time (Moffitt, 1993:695).

Considerable research and policy attention has been directed toward subgroups of high-rate offenders over the last two decades, most notably, the policy of selective incapacitation (Greenwood, 1982) and the arrival of "super predators" (Bennett et al., 1996). These intellectual moves culminated in the publication of a report by the Study Group on Serious and Violent Juvenile Offenders (Loeber and Farrington, 1998). Funded by the Office of Juvenile Justice and Delinquency Prevention, this study group integrated the literature on risk and protective factors and information on prevention and intervention strategies. One of their major arguments is that serious and violent juvenile offenders start displaying behavior problems and delinquency at an early age, implying, we are told, that it is never too early to intervene with at-risk children and their parents. The "risk factor" and associated typology paradigm is now popular in public policy circles, to the point that recent efforts have targeted eight year olds and advertised the ability to teach criminal justice officials the tool of identifying early the life-course-persistent offender.[1] If such groups are so easily and confidently identified, surely we should be able to validate them prospectively.

AGE, CRIME, AND GROUPS

Enter the age-invariance thesis (Hirschi and Gottfredson, 1983). Some critics of the developmental approach see risk factors as being the same for all offender groups. Although risk factors may vary in degrees, the same underlying causal factors are thought to distinguish offenders from nonoffenders, early starters from late starters, persisters from desisters, and so on. Gottfredson and Hirschi (1990) go one step further and argue that there is a single risk factor (and cause) at work—low self-control—and that this factor can explain crime at all ages. Put differently, the age-invariance thesis in Hirschi and Gottfredson (1983) posits that crime

1. For those readers who think we overstate this concern, consider the effort underway in England to target future criminals among eight year olds (see, e.g., http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2002/10/24/nyoof24.xml). Or in the United States, consider the National Summit on Violence Throughout the Lifespan (1999), where it was pronounced: "The latest generation of research has revealed that one of the only effective opportunities to prevent Lifetime Persistent offending may be the first three years of life." It is rare to witness such certainty in social science research.

declines similarly with age for all offenders, and hence, that desistance is a general or universal process.

A number of challenges have arisen to the age-invariance argument, including strong methodological critiques from Greenberg (1985), Farrington (1986), and Steffensmeier et al. (1989). One of the most serious and valid objections was that Hirschi and Gottfredson (1983) relied on aggregate cross-sectional data on age and crime rather than on data following the same individuals over a substantial portion of the life course. There is, in fact, a surprising paucity of studies that meet the criteria of long-term, within-individual follow-up even to middle adulthood (for relevant studies, see Robins, 1966; McCord, 1980; Farrington, 2002). Within the same individuals, then, the age-crime thesis has been untested across the full life course.

In addition, largely overlooked in recent thinking about persistent offending and desistance from crime are the issues of mortality and incarceration. Information on death is crucial to identify more precisely who has desisted from crime as compared with those who have no criminal records due to death (Robins and O'Neal, 1958). Some have even speculated that high-rate criminal offenders die earlier and experience more violent deaths compared with low-rate offenders, a group Reiss (1989) referred to as "false desisters." Incapacitation is another phenomenon of concern given the well-known fact that high-rate, serious offenders are disproportionately more likely to be incarcerated (Blumstein et al., 1986). The consequence of this fact is that neglecting incarceration time in assessing trajectories of offending can have potentially important methodological consequences. For example, Piquero and his colleagues (2001) used data from the California Youth Authority and found that without incarceration time, 92% of the sample appeared to be on a desisting trajectory by their late 20s. Once exposure time was added to the model, 72% of the population showed a pattern of desistance.

In short, big questions with far reaching implications remain unanswered. Indeed, both the age invariance question and the linked question of whether there are distinct and ontologically valid groups of offenders have import for criminological theory, research, and policy. Although we obviously cannot address all aspects of the problem, our study is motivated to probe as deeply as possible into age and crime across the full life course, and to test one of the foundational and reigning assumptions of modern criminology—the foretold persistent offender.[2]

2. A reviewer asked if criminologists really believe in such a group, or whether we might be setting up a "straw man" argument. This is a good question to which we have two responses. First, consider that by common usage and any dictionary definition, the terms "chronic" and "persistent" mean things like unceasing, relentless, and constant. If criminal-career or typological theories really mean high rate instead of

DATA

The data analyzed in this paper are based on an intensive 35-year follow-up of the original delinquent boys from the Gluecks' *Unraveling Juvenile Delinquency* (1950) and later follow-ups. The Gluecks' three-wave study of juvenile and adult criminal behavior involved a sample of 500 male delinquents ages 10–17 and 500 male nondelinquents ages 10–17 matched case-by-case on age, ethnicity, IQ, and low-income residence. Over a 25-year period (1940–1965), the Gluecks' research team collected a wealth of information on these subjects in childhood, adolescence, and adulthood (see Glueck and Glueck, 1950, 1968). Subjects were originally interviewed at an average age of 14, at age 25, and again at age 32 with only 8% attrition. An extensive analysis and theoretical framework to understand continuity and change in crime for the Glueck men up to age 32 was presented in *Crime in the Making* (Sampson and Laub, 1993).

The men were born between 1924 and 1932 and grew up in central Boston. When we launched a follow-up study in 1993, the oldest subject was reaching 70 years of age and the youngest 61. The obstacles to this follow-up were considerable, the main one being the significant time gap since the men were last contacted between 1957 and 1964. The last address we had available was some 35 years old. Few, if any, of the men had telephone numbers recorded in their case files in the Glueck archive. Also, only for roughly 1 in 20 men was a social security number available, a key

chronicity or persistence through time, then the lexicon of criminology needs to be changed. After all, as Gottfredson and Hirschi (1986) argued, the language of the criminal career model would then become excess baggage. Second, and more important, we believe a review of the literature does establish clear theoretical and influential policy commitments to the idea that there is (or may be) a small group of offenders who are generally constant in their offending patterns by age. In reviewing the debate about criminal career research in *Criminology* initiated by Gottfredson and Hirschi (1986), Blumstein et al. (1988:32) specifically argued that declines in offending with age are the result of changes in participation, not changes in frequency. Even the neutral commentator Charles Tittle commented that criminal career researchers appeared "secure" in their belief that there was a group of offenders whose offending did not decline with age (1988:76). Some 15 years later, in the most recent and extensive review of this issue, Piquero et al. (2003:385) conclude that "The decline in the aggregate age/crime curve may be entirely attributable to the termination of criminal careers, and the average value of lambda could stay constant (or increase or decrease with age) for those offenders who remain active after the peak." Further, at the core of Moffitt's (1993) developmental taxonomy is the prediction of pervasive and stable offending over the entire life course for the small group she calls Life-Course-Persistent Offenders. Despite the widespread impact of typological accounts, then, it remains unclear whether chronic offenders or their counterparts, life-course persisters, really exist as a distinct group, offend at a nearly constant rate with age, and can be predicted. These linked questions, which have important theoretical and empirical implications, are ones this paper seeks to answer.

identifier for tracking subjects in modern, large-scale databases. Of course, unlike old college classmates who may want to be found, we were also searching for men who had a criminal past and, sometimes, a criminal present. We knew some men continued to lead criminal and deviant lives, and we suspected that they would not necessarily be interested in being located by us, let alone by the police or bill collectors, among others. At the same time, there were cases where men had reformed and their current partners, employers, and other significant others may have been unaware of their delinquent past.

Our follow-up study nonetheless set out to accomplish three major tasks: 1) the collection of criminal records, both at the state and national levels; 2) the collection of death records, both at the state and national levels; and 3) finding a subset of the original delinquent subjects of the Gluecks' study and interviewing them. This paper concentrates on the first two components.

CRIMINAL RECORDS SEARCH

We began our follow-up study with a detailed search of the Massachusetts criminal history database. Criminal records were manually searched at the Massachusetts Office of the Commissioner of Probation between January and June 1993 for 475 of the original 500 delinquents.[3] Operating since 1926, the Office of the Commissioner of Probation is the central repository of criminal record data for the state of Massachusetts. All criminal offenses presentable to court are reported to this central system. These data allowed us to update the official criminal history for the delinquents in the Glueck study after age 31. From these records, we categorized each arrest charge as one of four offense types—violent, property, alcohol/drug, and other.[4] The age of the subject at the time of the arrest was also coded for each of his arrests.

Unfortunately, the Massachusetts data do not provide any information for those subjects who moved out of state or for those men who reside in the state, but may have committed crimes out of state. The extent to

3. Note that 25 subjects had deceased during the Gluecks' original follow-up study up to age 32 and these cases were not included in our records search. Also, although the Gluecks collected data for 438 subjects at all three waves, we used as our base for the criminal record searches all known living subjects ($N = 475$).

4. Violent offenses primarily included homicide, assault, rape, and robbery. Property crimes primarily included burglary, larceny, auto theft, fraud, and vandalism. Alcohol and drug offenses included drunkenness, operating under the influence, and narcotics (both selling and possession). The "other" category included a wide range of offenses such as conspiracy to commit theft, assuming to be a police officer, disorderly conduct, vagrancy, gambling, traffic offenses such as speeding, lewdness, offenses against the family (e.g., nonsupport), resisting arrest, and hunting near a dwelling.

which this is a serious concern is not known. It may be that those men who were the most criminally active moved out of state for at least some portion of their career. At the same time, the rates of interstate mobility for this cohort of men are relatively low. Moreover, Widom (1989:259) found that local police departments accounted for 80% of the adult arrests on record in her follow-up study. At the very least, it appears that state level data provide an important foundation for a study of criminal careers over the life span.

To supplement our state level data, we obtained criminal histories from the Federal Bureau of Investigation.[5] These records were searched during the months of February and March 1996 and, in effect, cover the period through calendar year 1995. The FBI rap sheets were coded in a similar fashion to the Massachusetts data; i.e., beginning at age 32, age-specific arrests by crime type were coded.[6] Our goal was to use the FBI data to supplement the existing data we had from Massachusetts. Therefore, we coded all arrests after age 31 that did not appear in the Massachusetts criminal history data. These consisted of arrests that occurred out of state and arrests that occurred in Massachusetts, but for some reason were not recorded in the state level data. A much larger proportion of men had a record in Massachusetts, but no FBI rap sheet (29%) compared with the proportion of men who had a FBI rap sheet, but no record in Massachusetts (6%). As Weisburd and Waring (2001:29) concluded, less serious offenses (e.g., traffic violations, passing bad checks, failure to pay child support) are not likely to be reported to the FBI (see also Geerken, 1994). Overall, 55% of the men had a record in both data sources.

The strategy of collecting information from both state and national criminal history data systems paid off when we consider the distribution of arrests after age 31 in the FBI records, but not in the Massachusetts records. Ninety-eight men were arrested after age 31, but they did not have a record in Massachusetts for those particular arrests. These men were responsible for 414 offenses, with a mean offending rate of 4.22. Thirteen men were responsible for 51% of all the offenses recorded on the FBI rap sheets for these 98 men. If we had relied only on records from Massachusetts, we would have missed these offenses, and perhaps worse,

5. The process to secure these data took about 18 months. With the assistance of the National Institute of Justice, we were able to access FBI rap sheets for all 475 Glueck men. We thank Winnie Reed of the National Institute of Justice for her help in securing these data.

6. The problems regarding data on dispositions from FBI, state, and local rap sheets have been extensively discussed in the literature (e.g., Geerken, 1994, Weisburd and Waring, 2001).

depending on crime type, we may have referred to these 98 men as desisters from crime. As expected, the bulk of these offenses were committed out of the state of Massachusetts.

It is well known that official criminal records are limited to offenses that come to the attention of the criminal justice system and, hence, refer only to official criminal histories. Although limited in this way, it is also well known that official data capture serious offenses (e.g., robbery) fairly well (Blumstein et al., 1986), and as we will show, the Massachusetts criminal histories contain a surprising amount of "nonserious" crime as well. Moreover, the criminal record data from the Massachusetts Office of the Commissioner of Probation have been used successfully in prior criminological research (Sampson and Laub, 1993), and data gathered from FBI rap sheets have for a long time been considered the "gold standard" in research on criminal careers (Blumstein, et al., 1986; Weisburd and Waring, 2001). We would add that alternative strategies (e.g., retrospective self-reports over 50 years) are no less limited.

DEATH RECORDS SEARCH

As we searched the criminal records, we simultaneously began a search of death records. We started with the Massachusetts Registry of Vital Records and Statistics during July and August 1993. In all, 475 subjects were searched from their thirty-second birthday, unless an arrest date showed a later search date was appropriate. We already knew the dates and the cause of death for the 25 subjects who died during the Gluecks' study. Once a record of death was found, we purchased the death certificate from the Registry. Next, we conducted a search for the remaining living men using the National Death Index (NDI) maintained by the National Center for Health Statistics (National Center for Health Statistics, 1990).[7] The NDI is a centralized, computerized index of death record information for all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. The index begins with deaths in 1979. We searched this index in October and November 1993 and uncovered additional deaths, both in Massachusetts and out of state, through calendar year 1992. We also updated death records periodically throughout the follow-up study. For example, the Massachusetts death records were last searched for all subjects known to be alive in the summer of 1996. The National Death Registry was searched again in November 1996, and those data covered the years 1992 through 1995. Furthermore, obituaries in the *Boston Globe* were examined on a daily basis throughout the project period

7. We thank Dr. George Vaillant for his assistance in gaining access to these records.

(1993–1998). We coded all dates of death and integrated them into our longitudinal data on criminal histories to age 70.

AGE AND LONG-TERM CRIME PATTERNS

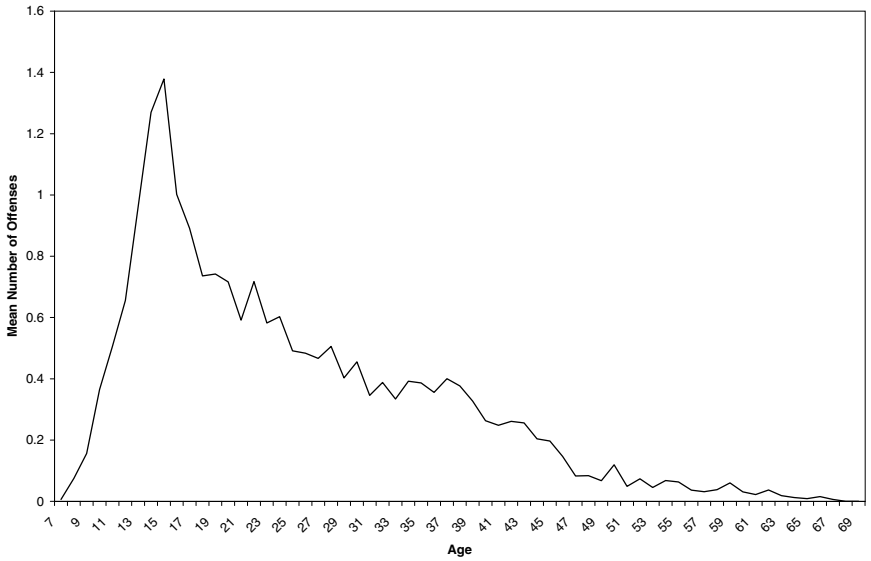
Following our belief that the facts about crime in long-term perspective are not yet fully known, the first set of questions we address are intentionally descriptive and pertain to core patterns of age, crime, and desistance. Is the age-crime curve invariant across the lives of the same individual offenders? How much crime is there in middle age and later life? What types of crime are most common among older offenders? When does desistance occur?

We began by creating person-period observations in our data. For each of up to 63 observations from ages 7 to 70, we coded the number of recorded arrests by crime type.[8] Figure 1 displays the almost 31,500 person-by-age crime counts where mortality is accounted for; specifically, each observation is censored after the time of death for men who died. The y-axis is the mean of total recorded offenses. Note the asymmetric but still tee-pee-shaped age-crime pattern for the total offense rate, representing more than 9,500 recorded and coded crime events. There is a sharp increase peaking in adolescence followed by a less sharp decline through middle adulthood, with eventual disappearance in the sixties. Hence, the first and perhaps unexpected point revealed by our analysis is that the classic age-crime pattern (Hirschi and Gottfredson, 1983) is replicated even within a population that was selected for their serious, persistent delinquent activity. It is not obvious from the criminal career model that this should be so, although of course it may be that there are some subgroups in the data that do conform to a flatter age-crime pattern. We investigate this possibility below.

Consider next the age-crime curves disaggregated by type of crime displayed in Figure 2. The first three graphs display the actual or raw curves for property, violence, and alcohol/drug offenses (Figures 2a, b, c, respectively). The total age-crime pattern observed in Figure 1 holds up in a rough sense for each type of crime, but the peak age and rate of decline are clearly less sharp for violence and alcohol/drugs. Because a large share of total crime is accounted for by property offenses, virtually the same age-crime pattern is revealed for property crime. For violent crime, however, the peak age of offending is in the twenties and the rate of decline is more erratic over time, with some offenders remaining active

8. Our analysis is actually restricted to 480 of the original 500 delinquents. Twenty cases were randomly lost in the early 1970s during the archiving process and thus have missing data from ages 7 to 32. Sampson and Laub (1993) showed nothing unusual for these cases.

Figure 1. Actual Mean Number of Offenses for Total Crime (Total Events = 9,548): Ages 7 to 70



well into their forties even though the rate of violent offending is low relative to the other crime types. Perhaps more interestingly, alcohol and drug offending is clustered and looks relatively flat between the ages of 20 and about 47, and then sharply declines. Although this measure contains arrests for alcohol and drug offenses, the vast majority of arrests are for alcohol-related crimes. For both violence and alcohol/drug offenses, then, it is apparent that censoring or artificially truncating life-course data on crime in the twenties or even early thirties, as is typical in criminology and even work on the Gluecks' data (Sampson and Laub, 1993; see also Laub et al., 1998), is problematic at best.

In Figure 2d, we smooth the age-crime curves for each offense with a prediction model consistent with the asymmetric pattern in Figures 1, 2a–c, and prior research. Specifically, we estimated a Poisson regression model of crime-specific counts in each observation period, with the best fit to the data obtained by a cubed polynomial represented by terms for age, age squared, and age cubed.[9] The smoothed plots thus reflect the predicted number of offenses in this specification. The resulting overlays in

9. This strategy is similar to that recommended by Osgood and Rowe (1994), who propose latent trait models where the dimensions of the criminal activity (e.g., participation and frequency) are regarded as manifestations of an underlying latent trait. We model variations across age in the event rate of crime using a probabilistic Poisson process.

Figure 2. Actual and Predicted Mean Number of Offenses, By Type of Crime

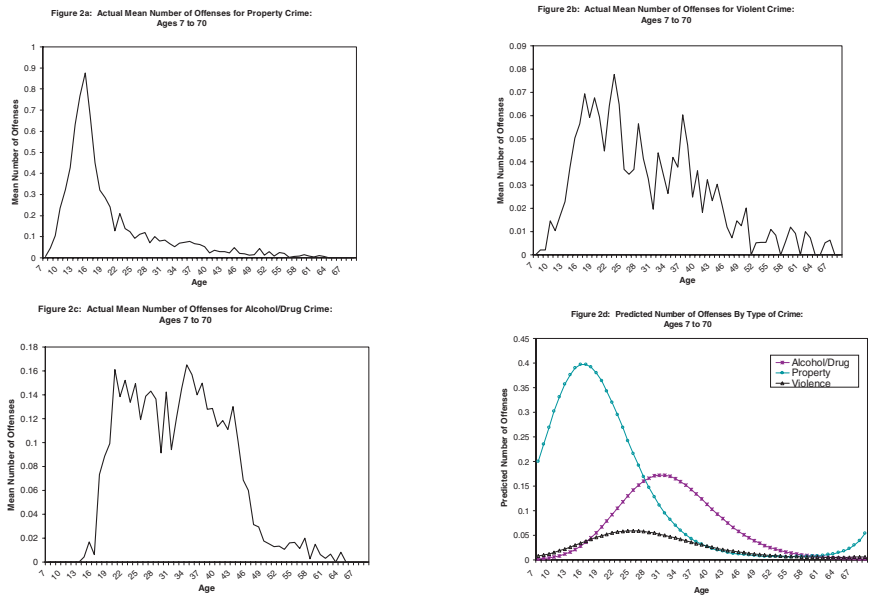


Figure 2d confirm the distinct differences in peak age and rate of decline for property, violence, and alcohol offenses. The coefficients for age, age^2, and age^3 were significantly positive, negative, and positive, respectively, reflecting the sharply escalating and then moderating decline in offending. (The small up-tick in the predicted property trajectory post age 67 appears artifactual, however, as there are no offenses in that period and it disappears in a quadratic model; the same holds for violence in Figure 3 below). Because of the rarity of some offense counts for each person-year broken out by crime type, we also estimated a logistic regression model predicting whether there was a recorded crime (recoded to yes, no) in each period. Violence in particular is very skewed and infrequent in the latter years. The predicted logistic probabilities nonetheless replicated the pattern of the Poisson models.

In Table 1, we turn to a detailed descriptive analysis of the parameters of the men's criminal careers over the life span. We see that although 84% of the Gluecks' delinquents were arrested between age 17 and 24, the participation rate declines sharply with age. Generally, this declining pattern holds for the crime-specific categories, but note the relatively high participation rates for alcohol/drug offenses that hold rather steadily between

early adulthood and age 50. These data suggest that offending in middle adulthood (beyond age 30) is more extensive than commonly believed. Consider that 44% of the men were arrested between the ages of 40 and 49, 23% were arrested between the ages of 50 and 59, and 12% were arrested between the ages of 60 and 69. Although a relatively small proportion overall, it appears that a nontrivial portion of the Glueck delinquents were arrested in each decade of their life.[10]

Table 1. Descriptive Data on Criminal Careers in the Delinquent Group

Participation	Percent Arrested by Age:					
	17-24	25-31	32-39	40-49	50-59	60-69
Total	84%	65%	60%	44%	23%	12%
Violent	33%	16%	18%	14%	7%	3%
Property	61%	27%	22%	14%	8%	2%
Alcohol/Drug	35%	29%	28%	21%	9%	7%
Other	67%	49%	44%	28%	13%	5%
Incidence	Mean Number of Arrests by Age:					
	17-24	25-31	32-39	40-49	50-59	60-69
Total	5.04	2.96	2.83	1.76	0.56	0.20
Violent	0.49	0.23	0.31	0.22	0.08	0.05
Property	1.63	0.56	0.50	0.26	0.17	0.03
Alcohol/Drug	0.96	0.87	1.05	0.72	0.13	0.07
Other	1.96	1.30	0.97	0.56	0.18	0.05

	Mean:		
	Age of onset	Desistance age	Career Length (years)
Total	11.9	37.5	25.6
Violent	22.0	31.3	9.2
Property	12.6	26.2	13.6
Alcohol/Drug	25.3	36.8	11.4
Other	14.3	32.7	18.4

Data on incidence, onset, termination, and career length are also shown

10. The large representation of some offenses through the middle adult years is central to the validity of assessing Moffitt's (1993) perspective, which emphasizes the heterotypic continuity of offending. For example, she argues that life-course persistents who steal and fight as adolescents will as adults segue into other patterns of antisocial activity, such as drug abuse, alcoholism, domestic violence, and theft from employers. Although our data may not capture all of these behaviors, it is clear that a substantial portion of the Glueck men committed a wide variety of antisocial acts (e.g., driving while intoxicated, failing to pay child support, etc.) well into their forties. If life-course-persistent offenders exist, surely we should be able to find them in our data.

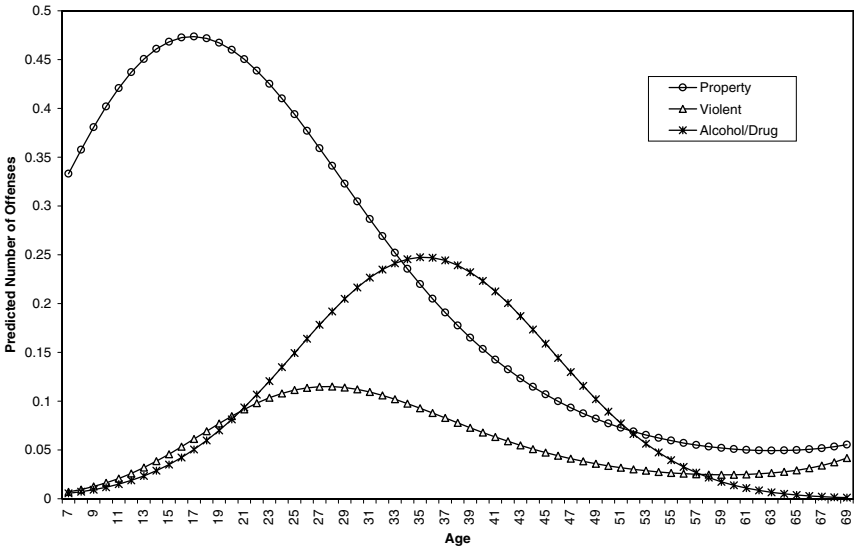
in Table 1. Incidence patterns are similar to those for prevalence. Consistent with Figure 2, what is noteworthy is that the highest incidence rate of alcohol and drug arrests occurs between the ages of 32 and 39. Incidence rates for violence are also high during this age period. The mean age of onset (defined as first arrest) for total crime is 11.9, and the mean age of desistance (defined as last arrest) for total crime is 37.5. Perhaps foreshadowed by their active juvenile years in crime, the average career length of the delinquent group is a substantial 25.6 years! Consistent with the graphical data, the mean age of onset for violence and alcohol and drug arrests is 22 and 25, respectively. The mean age of desistance for these crimes is 31 and 37, respectively. Violent criminal careers are the shortest (9 years). Despite this notable age variability in offending, however, there is a monotonic pattern of desistance. We find that for those men who survived to age 50, 24% had no arrests for predatory crime (crimes of violence and property) after age 17 (6% had no arrests for total crime); 48% had no arrests for predatory crime after age 25 (19% for total crime); 60% had no arrests for predatory crime after age 31 (33% for total crime); and 79% had no arrests for predatory crime after age 40 (57% for total crime).

Aging out of crime is thus the norm—even the most serious delinquents desist. This conclusion holds even if we impose a strict restriction on active offenders. Following the logic of the criminal career model (see also Blumstein and Cohen, 1979), we selected those men who had one or more arrests at ages 7 to 16, 17 to 24, 25 to 31, 32 to 39, 40 to 49, and 50 to 59. In other words, we selected offenders active in each of the major transitions during young adulthood and in each decade of life to age 60. There are 46 (about 10%) such active offenders, clearly a small group defined as "life-course-persistent" in terms of crime participation. Figure 3 graphs their frequency of crime by age using the same procedures as for Figure 2d. There is little ambiguity that all crimes eventually decline with age. Rather remarkably, then, the data in Figures 1–3 and Table 1 suggest that the age-crime decline in the general population is replicated, almost in identical (fractal?) fashion, for these active, serious offenders.

PROSPECTIVELY DEFINED GROUPS

The essential idea of developmental taxonomy approaches is that there are distinct groups of offenders whose etiological significance can be traced to early risk factors. If such typological approaches hold merit, then we should see basic and distinctive patterns of adult life-course trajectories that vary by the factors that allegedly produce the groups in the first place. We thus investigate our ability to predict, prospectively, long-term patterns of offending on the basis of childhood and adolescent risk

Figure 3. Predicted Number of Offenses By Age and Type of Crime: Offenders Active at Ages 7-16, 17-24, 25-31, 32-39, 40-49, and 50-59 (N = 46)



factors. We pose a simple yet powerful question that has not been addressed in the criminological literature: Does the age-crime trajectory follow a different pattern across the life course of delinquents according to the causal categories specified by typological theories? We also investigate whether those identified as life-course persisters at one phase of life remain so at a later phase. Our data have shown there is considerable crime in later adulthood, but are the offenses generated by the same people who committed offenses at a younger age?

To test the ability of typological theories of crime to predict offending trajectories, we present age-crime curves classified according to a variety of prospectively defined risk criteria. To be true to the major extant perspectives, we sought to err on the side of inclusiveness. We selected 13 measures from multiple sources (parents, teachers, official records, and the boys themselves) that tap either classic individual-difference risk factors or the observed propensity to offend in the early years of life. Measures of individual differences include some of the most venerable and sturdy predictors of crime, especially cognitive abilities (Moffitt, 1994:16), temperament (Moffitt, 1993: 695), personality traits (Caspi et al., 1994; Hawkins, et al., 2000), and childhood behaviors (Moffitt, 1994:15). In addition, guided by the substantial body of research on criminal careers,

we focused on early and frequent involvement in crime and delinquency (Blumstein et al., 1986:72, 94).

Verbal intelligence (see Moffitt, 1993) was assessed using the Wechsler-Bellevue IQ test and coded into eight categories ranging from one (120 and above) to eight (59 and below). The mean verbal IQ for the delinquent sample was 88.6. We also examine the full-scale IQ score that includes both math and verbal skills, unrecoded. From detailed psychiatric assessments of the boy, we use four dichotomous variables of personality traits: extroverted ("uninhibited in regard to motor responses to stimuli"), adventurous ("desirous of change, excitement, or risk"), egocentric ("self-centered"), and aggressive ("inclined to impose one's will on others"). To capture the early onset of childhood behavior, we used self-reported age of onset of misbehavior, a dichotomous indicator based on teacher and parent reports of the subject engaging in violent and habitual temper tantrums while growing up, and a report from the mother as to whether the subject was overly restless and irritable growing up (we labeled this difficult child).

The level of delinquent conduct in adolescence was measured in several ways. We used an indicator of the average annual frequency of arrests in adolescence while not incarcerated and a composite scale (ranging from 1 to 26) based on unofficial self-, parent-, and teacher-reports of delinquent behavior (e.g., stealing, vandalism) and other misconduct (e.g., truancy, running away) not necessarily known to the police. Following the logic of the criminal career approach, we also included measures of the age at first arrest and age at first incarceration for each boy. Overall, the delinquency measures capture both the level and the developmental pattern of official and unofficial behavior up to an average of about 14 years of age for each boy.

To assess summary patterns, we followed the logic of risk factor theory by giving emphasis to the *combination of risks within the same boy*. We combined standardized indicators of all 13 variables in a single childhood risk indicator, with constituent items scored such that a high value indicated either the presence of antisocial behavior or an individual level risk (e.g., low verbal IQ, engaging in tantrums, early age of onset of antisocial behavior, and so on). We then looked at the distribution across all boys and created a group at highest risk for what Moffitt would call life-course-persistent offenders—namely, those boys in the upper 20% of the distribution. The bottom 80% group is defined as low risk. What is important to point out is that the groups were defined prospectively, in this case without recourse to information on the boys past their adolescence. Other than delinquency, which we separate out in a later analysis, the vast majority of measures refer to individual differences of the boys in childhood. The prospective ability of these measures to predict later involvement in

crime was demonstrated in earlier work (Sampson and Laub, 1993:92). The summary measure that captures boys in the upper quintile of risk is also predictive of levels of offending even up to the late fifties; for example, the childhood high-risk group accounted for twice as many recorded offenses at ages 50–59 as the nonrisk group ($p < .05$). Thus, although retrospective reporting is a concern we fully acknowledge, the multi-method and multi-reporter approach, combined with the diversity of measures and their demonstrated validity in predicting stability of offending, speaks to the utility of considering the link between childhood risk and trajectories of crime throughout life.

The data in Figures 4 to 6 show long-term trajectories for property crime, violent crime, and alcohol/drug crime, respectively. Separate logistic and Poisson-based regressions of counts were performed for each crime type and childhood risk with similar results; for simplicity in the subgroup analysis, the graphs depict the predicted logistic probabilities for these crime types at each age from 7 to 70 by level of childhood risk. Starting with the predicted probabilities for property (Figure 4), which mimics the total crime rate, the data show that the two groups' life-course trajectories share an almost identical path through time, albeit at different levels of offending. That is, there is some stability in offending patterns, but both groups peak and then decline toward zero in a way that appears general rather than causally distinct. Although at different peak ages, the same pattern emerges for violence (Figure 5) and alcohol/drugs (Figure 6). In fact, the violent crime patterns yield virtually a textbook example of Hirschi and Gottfredson's (1983) argument (allowing for differences in peak ages of offending) even though the two groups were defined according to their risk for divergent developmental patterns.

One might argue that the results so far are confounded by the particular risk factors selected in childhood and adolescence. What if we restricted the comparison to just the individual-difference factors, eliminating the indicators of actual juvenile offending? We performed this analysis but the patterns were identical—childhood risk factors predict a modest level of stability (between-person differences), but the shape of the trajectories was identical (data not shown). One might further argue that our cutoff points were too lenient, and that we are not capturing the boys at truly high risk. We thus shifted the cutoff to the tenth percentile distribution, but again the results were identical. We then examined the distribution of self-, parent-, and teacher-reported acts up to age 14 (on average) and selected the high-rate juvenile offenders as defined by those boys in the top 10% of the distribution. Because we are analyzing data from a sample of delinquent and incarcerated boys to begin with (promising candidates for life-course persisters), by any reasonable definition, the boys in the upper 10% of this group should be tapping the small subset (typically

Figure 4 Predicted Probability of Offending by Age for Property Crime: Comparison between Childhood Risk = 0 and Childhood Risk = 1

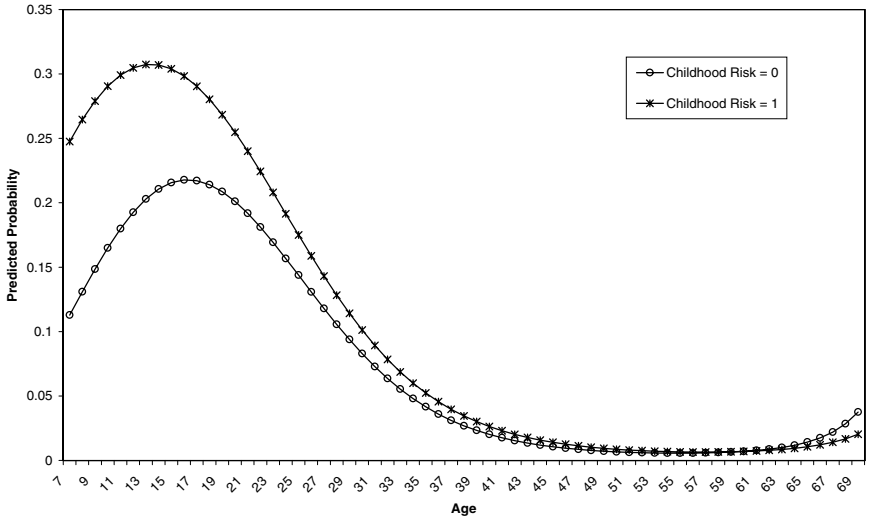


Figure 5 Predicted Probability of Offending by Age for Violent Crime: Comparison between Childhood Risk = 0 and Childhood Risk = 1

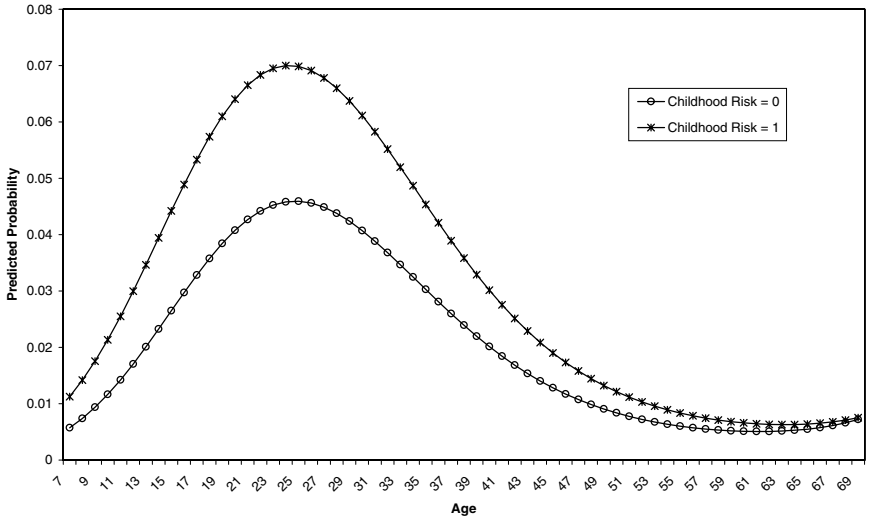


Figure 6 Predicted Probability of Offending by Age for Alcohol/Drug Crime: Comparison between Childhood Risk = 0 and Childhood Risk = 1

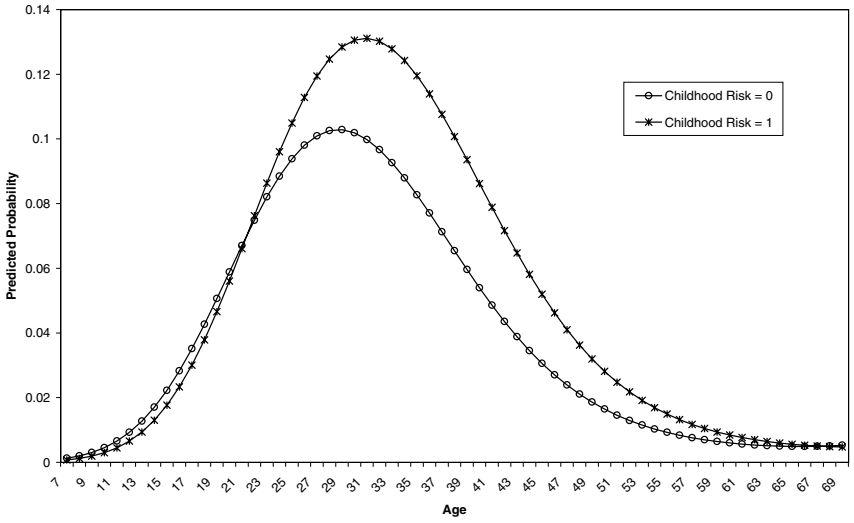
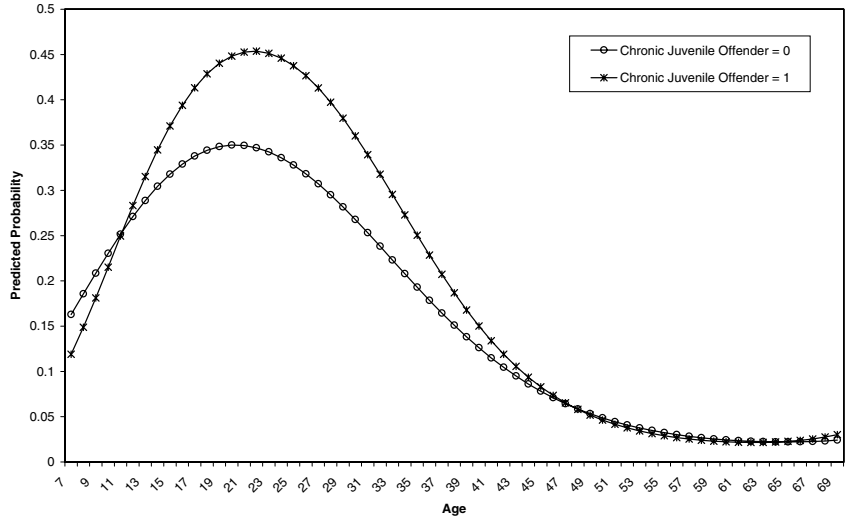


Figure 7 Predicted Probability of Offending by Age for Total Crime: Comparison between Chronic Juvenile Offending = 0 and Chronic Juvenile Offending = 1



thought to represent about 5% of males in the general population) that exhibit serious conduct disorder and life-course-persistent offending.

Figure 7 compares these high-rate chronic offenders with the offenders in the bottom 90% of the juvenile offending distribution for total crime. Again, there is no evidence of differential shape or patterning to the trajectories other than level. Might crime type account for the lack of typological differences, for example, by concealing a subset of violent predators? Disaggregation by violence, property, and alcohol/drug trajectories revealed differences in peak ages and frequency, but again the shape was invariant (data not shown). The prospectively identified persisters offend at a higher level but decline markedly in their criminal activity for the last decades of their lives. As an even stricter test, we allowed the predictions to be (tautologically?) generated using adult crime data to age 70. We summed the total number of arrests (nearly 10,000 in total) for each man up to age 70. We then selected those men in the upper 10% of the distribution and compared them with the vast majority (nine in ten) delinquent boys who fell in the bottom of the distribution of lifetime offending frequency. Even with this split, the data again failed to reveal a distinct pattern of persistent offending over time (data not shown). Active adult criminals reduce rather dramatically their activity in criminal offending with advancing age.[11]

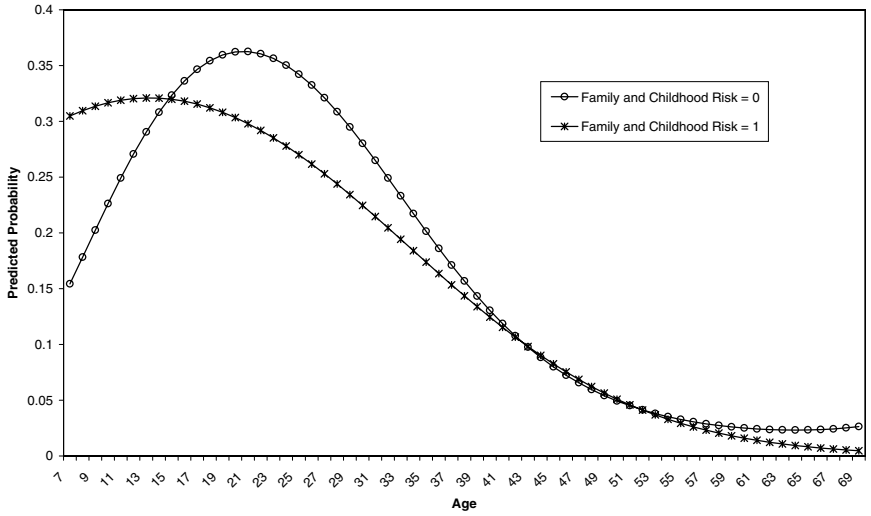
Perhaps most important, we conducted analyses that interacted individual risk factors with key "criminogenic environments" (Moffitt, 1993) during the turbulent years of child and adolescent development, especially in the family. A long history of research, including on the Gluecks' data, has shown that family structural conditions (e.g., poverty, large family size, residential mobility) and family social processes such as poor supervision, erratic/threatening discipline, and weak parental attachment are strong predictors of adolescent delinquency (see Sampson and Laub, 1993: Ch. 4). Moffitt (1993) argues that when a child's vulnerability is compounded with such negative family conditions, life-course-persistent offending is most likely to occur. It is interesting to note that the interaction argument undermines the assertion of prospective predictability from early individual differences alone—it cannot be "all over" for troubled children at an

11. We explored numerous alternative conceptualizations of child and adolescent risk and behavior (e.g., parental criminality and alcohol abuse, parental mental disturbance, the number of grades repeated, and other personality variables such as stubbornness). These analyses showed the same pattern; i.e., we did not see any indication that stable, individual characteristics can account for variation in offending in later life conditioned on adolescent delinquency.

early age if life-course persisters emerge *in interaction* with *later* criminogenic environments. In this sense, the widespread and current bandwagon propounding early intervention is not consistent with the logic of Moffitt's (1993) actual argument.

Be that as it may, we can directly examine trajectories of offending for boys who differ according to theoretically defined interactions of childhood and family risk. Following theory and past research, we highlight two major dimensions of criminogenic family environments. Drawing on Sampson and Laub's (1993) analysis, we conducted a principal components analysis that reduced the dimensionality of a set of theoretically and empirically salient items. Two key dimensions emerged, the first defined by high residential mobility, parental emotional instability, low maternal supervision, and hostility between father and son. Poverty, large families, and erratic/harsh methods of discipline defined the second dimension. These factors make sense based on prior criminological work, and moreover, each "criminogenic family" factor independently predicts the level of adolescent delinquency ($p < .05$) within the delinquent group.

Figure 8 Predicted Probability of Offending by Age for Total Crime: Comparison between Family and Childhood Risk = 0 and Family and Childhood Risk = 1



We then selected those boys who were in the upper half of the distribution of each orthogonal factor (hence approximately 25% of the boys) and who were in the upper 20% of the distribution of the individual-level

childhood-risk score. In other words, we interacted the multiple indicators, with the end result that approximately 4% of the delinquent group members are defined as truly high risk. These boys experienced not only the extremes of criminogenic family environments, but also they were vulnerable from the start based on multiple childhood risks.

Figure 8 presents the predicted trajectories of offending for these boys compared with the rest of the delinquent group. Perhaps not surprisingly, the rate of offending for the high-risk group is higher in the early years up to the point of the traditional peak age of offending—about 15. Thereafter the rate of offending drops off and the boys desist just like all others. Amazingly, in fact, the rates of offending are higher for the low-rate group later in adolescence. But the big picture is clear—the age-crime curves look the same as in the earlier figures. We see increasing and then declining involvement in crime for all risk groups. Our basic conclusion thus continues to hold, namely, that desistance and aging out of crime appear to reflect a general process. Despite the interaction of childhood with criminogenic family environments, we see no evidence of a group that, prospectively at least, continues to offend at a high rate throughout the life course.

For a different look at the stability and predictive power of the interaction of childhood-family risk, we posed another straightforward question. Are those boys at highest risk for child and adolescent crime the same individuals who account for life-course-persistent offending as adult men? To address this question, we summed the frequency of crime events from ages 25 to 60 (given that there is almost no crime post age 60). Then we selected men with a child*family risk score of 1 who survived to age 60 (11 of 18) and examined where they stood in the relative rankings of ages 25–60 crime. Although clearly a small group, these 11 men accounted for over 200 arrests before age 25. Yet over 50% (six men) were in the bottom quartile of adult offending, and only two men were in the upper quartile, not what we would expect if stability of rankings was the rule. To capture persistence of adult offending as opposed to frequency, we also looked at the data from another angle by determining those men who were criminally involved during each decade of adult life. Some 17% of high child*family risk boys were persistent adult offenders compared with 23% of boys with no interaction of childhood and family risk ($p = .40$, not significant). Clearly, and yet again, the data are firm in signaling that persistent and frequent offending in the adult years is not easily divined from zeroing in on juvenile offenders at risk.

MORTALITY AND INCARCERATION

As noted earlier, mortality and incarceration are often overlooked in

analyses of persistent offending and desistance from crime, especially using official records. Both are potentially a problem in the current study. In the longitudinal follow-up to age 32 for the subjects in the *Unraveling* study, the Gluecks found that the death rate for the delinquents was twice that for the nondelinquent controls (1968:46), raising the specter of a contaminated age-crime relationship. This death-gap maintains in scope until the end of our observation period, with half of the men dead by age 70 compared with less than 30% of the controls. Even so, our data confirm the persistence of the age effect among high-rate delinquents: Each person-period observation represented in Figures 1 to 8 censored the observation for death, and hence, the mean offense counts were based on the risk pool of men that were alive.

One might still wonder whether those who died early would have been "life-course-persistent offenders" had they survived until age 70.[12] To further examine mortality and long-term offending patterns, we constructed an age-crime curve for the men who died and found the level and shape identical to the age-crime curve for the men who were alive (data not shown). We also found similar age-crime curves controlling for childhood risk among the sample of men who died. It remains true that high-rate offenders die earlier, but then again developmental theories make claims about offending over the full life course and the ability of individual differences and childhood factors to predict long-term patterns of offending. If high-rate offenders tend to die early, say before age 30, then the idea of life-course-persistent offending loses much of its appeal. Moreover, if high-rate offenders are selectively removed from the population through early death, then the policy relevance of the idea of life-course-persistent offenders becomes less clear.

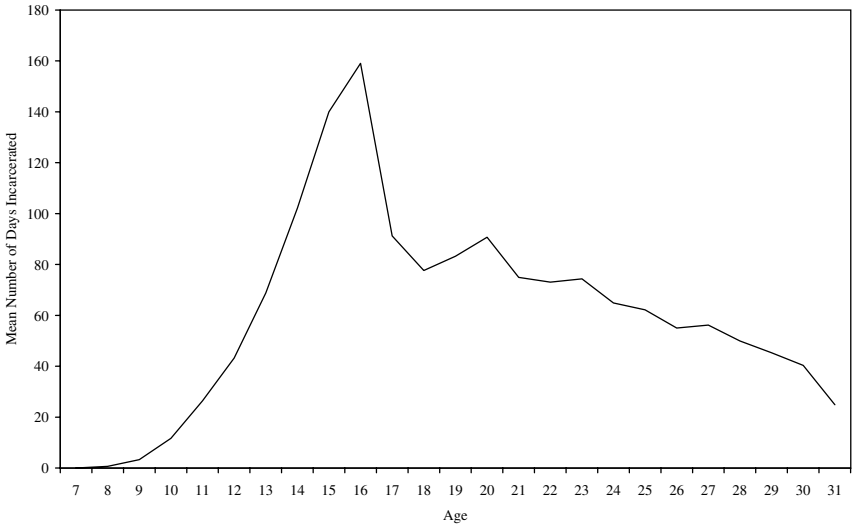
Incapacitation is another phenomenon of concern given the well-known fact that high-rate, serious offenders are disproportionately more likely to be incarcerated (Blumstein et al., 1986). The consequence of this fact is that neglecting incarceration time in assessing trajectories of offending can have potentially important methodological consequences. We investigate this issue using data on the number of days incarcerated each year up to the age of 32 in order to provide a more accurate picture of desistance from criminal careers. Figure 9 displays the raw number of days incarcerated. Interestingly, incarceration careers repeat the classic age-crime pattern that we observe for total and property crime. This is not an obvious outcome because the common belief is that incarceration is lagged in time from offending, in that it takes some period of offending before one gets

12. We thank an anonymous reviewer for raising this question.

to the incapacitation phase. Note also the magnitude of the phenomenon—the average number of days incarcerated per year tops 150 days at age 16.

What happens if we take this considerable time off the street into account in assessing criminal careers? Using the number of days incarcerated each year to age 32, we estimated a Poisson model of event rates while free by age ("lambda", in the criminal career model) for each childhood risk group. As seen in Figure 10, again the trajectories are very similar for our main childhood risk indicator, with both groups following a similar path to desistance. This basic result maintains when Figure 10 is replicated for crime-specific trajectories (data not shown). Figure 10 also displays the age-crime curve of lambda among the 46 life-course active offenders as defined in Figure 3. Here too we see the same age effect. Despite the considerable magnitude of death and incarceration associated with criminal offending, the age-crime curve is thus remarkably stable for both childhood risk groups and active offenders.

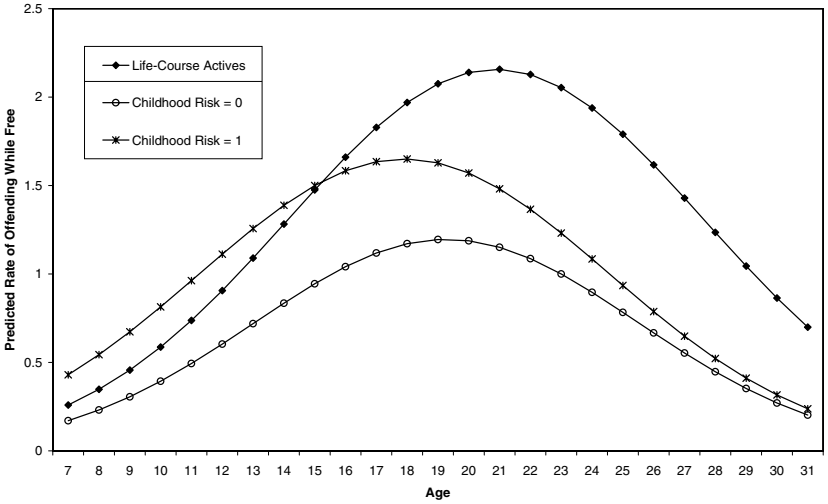
Figure 9 Actual Mean Number of Days Incarcerated per Year: Ages 7 to 32



LATENT CLASS MODELS OF DESISTANCE PATTERNS

So far we have restricted our analysis to prospectively defined groups of offenders based on childhood and adolescent risk factors, as in Figures 4 to 8. A different approach is to take the full life course as a given and ask

Figure 10 Predicted Rate of Offending While Free for Total Crime, Ages 7 to 32: Life-Course Active Offenders and Comparison between Childhood Risk = 0 and Childhood Risk = 1



whether there are distinct and latent offender groups based on ex-post patterns in offending. That is to say, are there latent classes as defined by trajectories of crime over the full life course? Are resulting trajectory groups linked to preexisting or childhood differences? Despite its prospective nature, in the analysis above, we could have masked underlying trajectory groups, such as life-course persisters. The main difference in the current approach, then, is that groups are defined not by early risk factors but rather by the outcome of offending using data to the end of each person's life. In addition, a formal statistical model of desistance is used by estimating an individual-level propensity to offend across time and the probability of being in a latent offender group (for further discussion, see Bushway et al., 2001). We thus formally capture age heterogeneity and view the problem from a new lens.

Nagin and Land's (1993) semiparametric group-based modeling approach offers an innovative way to satisfy our objective under the working assumption that the population comprises a mixture of several groups with distinct developmental trajectories. Because the specifics of this approach have been discussed in detail elsewhere (e.g., Jones et al., 2001; Nagin, 1999; Nagin and Land, 1993), our description here is brief. In general, the mixed Poisson model assumes that the population comprises discrete Poisson distributions with respect to the rate of offending. Each

trajectory assumes a polynomial relationship that links age and crime. Based on our earlier analysis, we use a cubic function of age for the 7 to 70 models, which allows for more flexibility in the shape of the trajectory over time. We estimated the equation:

$$\log(\lambda^j_{it}) = \beta_0^j + \beta_1^j\,(\mathrm{AGE})_{it} + \beta_2^j\,(\mathrm{AGE}^2)_{it} + \beta_3^j\,(\mathrm{AGE}^3)_{it},$$

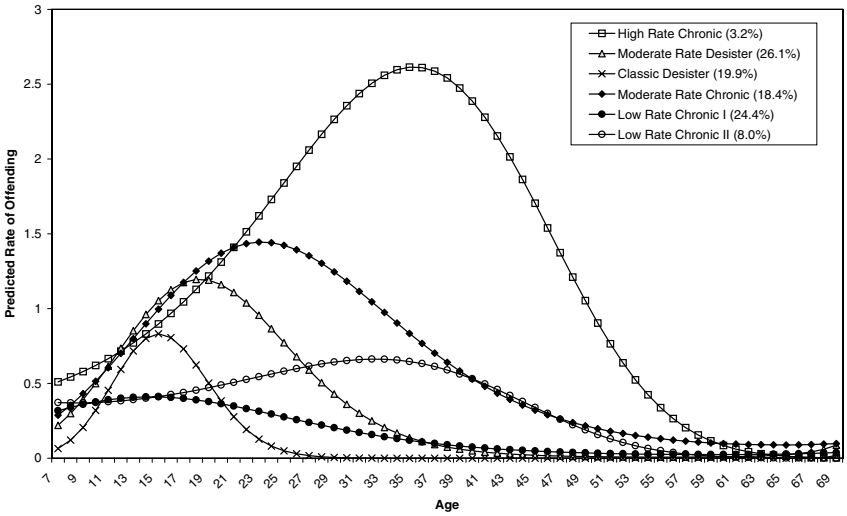
where λ^j_{it} is the predicted rate of offending for person i in group j for time period t, AGE_{it} is the age of person i for time period t, AGE_{it}^2 is the squared age of person i for time period t, and AGE_{it}^3 is the cubed age of person i for time period t, and the coefficients β_0^j, β_1^j, β_2^j, and β_3^j structure the shape of the trajectory for each group j. Although every individual in each group is constrained to the same slope and intercept of that trajectory, these parameters, which determine the level and shape of the trajectory, are free to vary by group. The final result from the semiparametric mixed Poisson method is a number of different groups comprising individuals who demonstrate similar patterns of offending over time.[13]

Using this trajectory method, we are able to address whether the age-crime relationship is invariant over time for all offenders and offenses in the Glueck delinquent sample. Figure 11 shows the results from semiparametric mixed Poisson models for total crime. It is clear that the age-crime relationship is not invariant for all offenders—heterogeneity in trajectories is present. Moreover, the data firmly reject a simple typology of two offender groups. There are instead six groups of offending patterns by age for total crime.[14] Although the latent class method does suggest the existence of a small group (3%) of what are commonly referred to as high-rate "chronics" or life-course persisters with a later peak age of offending, this group, like all groups, still reaches a declining pattern of offending. The difference across groups seems to be the age at desistance and level of offending rather than the emergence of a flat trajectory group with age. We believe this is a central finding that has been undetected by most prior research given the middle-adulthood censoring of observations in the major longitudinal studies of crime.

13. The models were estimated using the SAS-based TRAJ procedure (Jones et al., 2001). The trajectory method estimates model parameters using maximum likelihood for a fixed number of groups. The optimal number of groups was assessed using the Bayesian Information Criterion (BIC), which can inform the selection of the best model for comparison of both nested and unnested models (Nagin, 1999). We also estimated each individual's probability of membership in the offender groups. Based on these probabilities, individuals are assigned to the group to which they are most likely to belong based on their ex-post offending patterns (Nagin, 1999).

14. The mean group posterior probabilities range from 0.87 to 0.99, which are fairly high.

Figure 11 Offending Trajectories for Total Crime: Ages 7 to 70

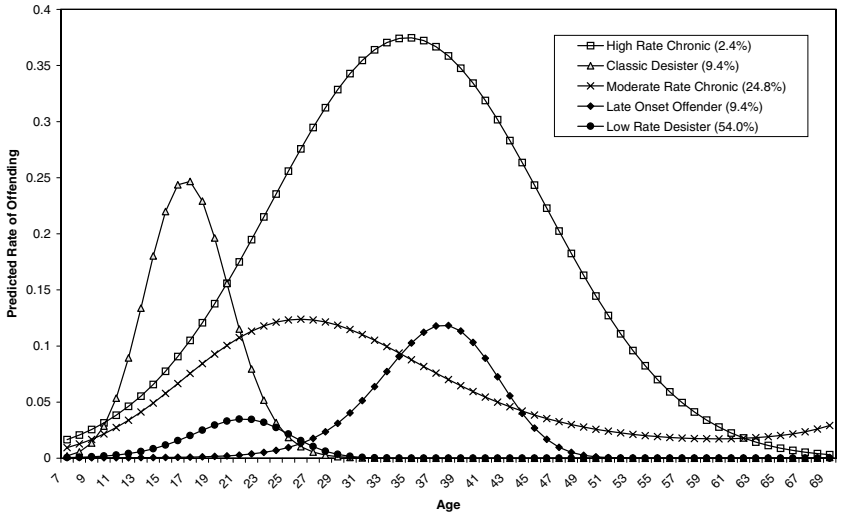


Crime-specific analyses (Figures 12 and 13) reveal five groups of offenders for violent and alcohol/drug offenses, respectively.[15] As for total crime, these data reveal that there are subgroups of offenders who do not display a uniform age-crime relationship (cf. Gottfredson and Hirschi, 1990). Once again, however, for both types of offenses, all offender groups eventually decline in their offending with age. Mortality is accounted for in these models, and the basic pattern holds when we account for offending per day free up to age 32 (data not shown). Thus, neither mortality nor incarceration serves to alter our basic conclusion in the latent class analysis, just as was the case for the prospectively defined trajectories.[16]

15. There were five groups for property crime as well, which we do not show for space reasons (available upon request). Given that property crime dominates the total count, however, the shape and pattern was very similar to total crime in Figure 11. The mean group assignment probabilities range from 0.72 to 0.93 for violent crime, and 0.85 to 0.99 for alcohol/drug offenses.

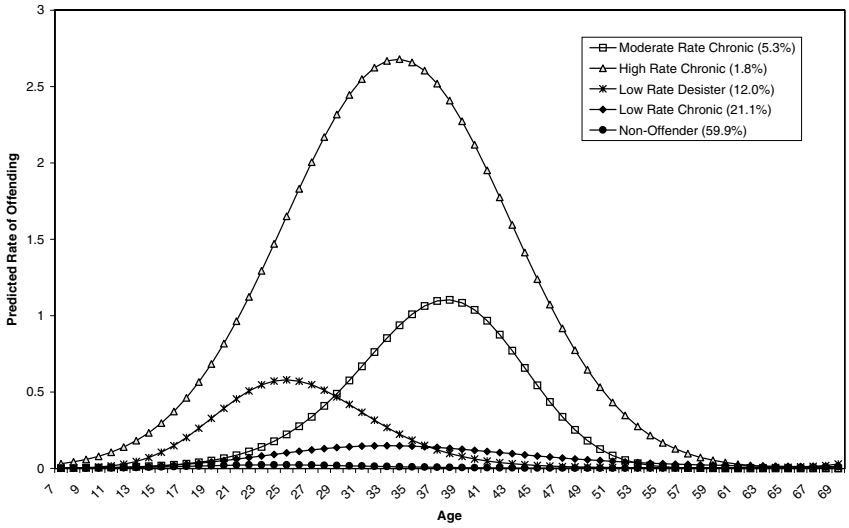
16. In order to assess whether the trajectory method adequately captured heterogeneity, we ran random effects models within each trajectory grouping to estimate the correlation between the error terms over time (rho). This correlation is the proportion of the joint variation in the error that is attributable to the time-stable individual-specific component. This correlation will be close to zero if the population of interest represents a homogenous population. We found that for total crime as well as crime-specific trajectories, rho was at or near zero for almost every trajectory group. The largest rho was 0.23 for the high-rate chronic group for alcohol/drugs.

Figure 12 Offending Trajectories for Violent Crime: Ages 7 to 70



We are now in a position to return to a key question: Do early risk factors distinguish trajectories and, hence, in this case, group membership? Table 2 displays the means for selected risk factors by group membership

Figure 13 Offending Trajectories for Alcohol/Drug Crime: Ages 7 to 70



for total crime. Looking at individual differences and parent/child disposition, the pattern is inconsistent and there are no statistically significant differences in means across the six groups of offenders. For example, neither low verbal IQ nor early onset, two classic risk factors, distinguish high- or moderate-rate chronics from classic desisters. Significant differences between groups emerge only for arrests and unofficial delinquency.

The main conclusion from these analyses is that once conditioned on delinquency, individual differences and childhood characteristics defined by risk rather than crime itself do not do a good job distinguishing among different offending trajectories over the long haul. The basic findings in Table 2 were also replicated controlling for incarceration, and in addition, we compared group means for several other risk variables, including low birth weight, poverty, and the "criminogenic family" measures such as parent-child attachment, supervision, and discipline styles examined in Figure 8. Overall, we found no statistically significant differences in the means across group membership. These findings, along with the results of the graphical analyses, suggest that life-course-persistent offenders are difficult, if not impossible, to identify prospectively using a wide variety of childhood and adolescent risk factors. The implications for criminological theory and intervention appear considerable, to which we now turn.

SUMMARY

We have attacked the age-crime and "offender group" question from multiple directions using what appears to be the longest longitudinal study in criminology, reflecting data on crime from 7 to 70. Although our data certainly have weaknesses, this long-term window allowed us to speak to a number of current controversies in theoretical criminology and criminal justice policy.

The findings seem clear on a number of fronts. First, the criminal career model appears justified if by that we mean the paradigm of studying within-individual trajectories. The aggregate age-crime curve is not the same as individual trajectories, one of the main claims of the criminal career model. On the other hand, crime declines with age *even for active offenders* (Figures 3 and 10), and trajectories of desistance could not be prospectively identified based on typological accounts rooted in childhood and individual differences. Although childhood prognoses are reasonably accurate in terms of predicting levels of crime between individuals, they do not yield distinct groupings that are valid prospectively in a straightforward test. Although peak ages of offending vary by crime type, we found that all offenses decline systematically in the middle adult years for groups identified prospectively according to extant theory and early risk factors. When we switched strategies and estimated latent classes of offender

Table 2. Comparison of Selected Childhood and Adolescent Risk Factors, By Trajectory Group Membership

Characteristic	High Rate Chronic (N=15)	Moderate Rate Desister (N=126)	Classic Desister (N=102)	Moderate Rate Chronic (N=88)	Low Rate Chronic I (N=113)	Low Rate Chronic II (N=36)
INDIVIDUAL DIFFERENCES						
Full Scale IQ	88.5	92.9	91.0	92.1	90.7	90.5
Verbal IQ	2.87	3.67	3.41	3.48	3.53	3.31
Percent Extroverted	73.3	56.3	58.8	63.6	48.7	58.3
Percent Adventurous	73.3	58.7	51.0	60.2	47.8	55.6
Percent Egocentric	6.7	11.9	15.7	11.4	14.2	13.9
Percent Aggressive	6.7	18.3	16.7	13.6	14.2	13.9
PARENT/CHILD DISPOSITION						
Parental Crime/Alcohol	2.27	2.09	1.87	2.01	1.98	1.92
Parental Instability	1.2	0.84	0.84	0.87	0.95	0.69
Percent Tantrums	53.3	43.7	41.2	42.0	31.9	36.1
Percent Difficult Child	57.1	54.8	57.4	63.2	60.0	62.9
Percent Early Onset	7.1	15.6	14.8	13.0	9.3	12.5
ADOLESCENT DELINQUENCY						
Arrest Frequency*	0.51	0.55	0.36	0.49	0.32	0.33
Unofficial Delinquency*	14.5	14.7	13.5	15.2	13.5	14.5

* $p < .05$

groups on an ex-post basis, a similar conclusion was obtained. Namely, although latent classes of offenders appeared to emerge based on trajectories of offending, supporting Nagin and Land (1993), group membership is not easily, if at all, predictable from individual, childhood, and adolescent risk factors.

We are hard pressed to attribute these conclusions solely to an artifact based on the data source. It is hard to imagine why a 45-year-old man, for example, compared with the same man at 40, would be any more or less likely to be arrested for the same crime. Recall that these are within-individual trajectories and not the comparison of different groups or cohorts of men with different characteristics often thought to influence processing (e.g., race, class). More important, the Glueck men as adults also engaged in all sorts of deviant activities that the Boston police appeared only too happy to record, including drunkenness, domestic violence, receiving stolen goods, failure to pay child support, and so on. To illustrate, there were 1,802 arrests for alcohol and drug use and over 3,000 arrests for other

minor offenses. The argument that the men could have been involved in other deviant activities is thus not compelling, in our view, to overturn the very strong patterns of desistance in the data. More generally, the wide variety of offenses that are captured suggests that in important respects, the Gluecks' data are analytically strategic.[17]

One might claim that we left out an important childhood or adolescent risk factor, or that some of our measures are suspect because of retrospective bias. These are real possibilities, of course, but any such bias would seem to have worked in favor of the typological accounts. If parents reported some of the risk indicators based on the actual delinquent behavior of the child, then those children would have increased risk for later life-course-persistent criminal behavior. Moreover, the central argument of Moffitt (1993) and the risk factor paradigm (e.g., Loeber and Farrington, 1998; Hawkins et al., 2000) is precisely that risks come in a bundle. What this means is that for our results to be invalid, the critic must point to an isolated risk factor that is uncorrelated with the more than dozen indicators we summarized. Recall that our strategy was based on the constellation of multiple risk factors within the same boy.

Another possible bias is that high-rate offenders are disproportionately incarcerated, injured, and killed, such that simple trajectories of offending may disguise the existence of persistent offenders who exit involuntarily from the risk pool. When death and incarceration were accounted for, however, the patterns remained remarkably similar even though, as expected, the more the delinquency the greater the likelihood of early death and incarceration.

RESOLUTION

That all offenses eventually decline by the middle adult years for all groups of offenders identified according to extant theory and a multitude of childhood and adolescent risk factors suggests that 1) general desistance processes are at work, and 2) although childhood prognoses are reasonably accurate in terms of predicting levels of crime, they do not yield distinct groupings that are valid prospectively for troubled kids. *It is precisely*

17. On the other hand, what of the claim that the "old" nature of the Gluecks' data make it irrelevant to modern-day concerns? We think this claim has it backwards from a scientific perspective. Because our focus is on within-individual patterns of crime over the full life course, we are required to examine cohorts that have lived long enough to rigorously test age-invariance and trajectory-group theses. The alternative is that the study of age and crime sit still while we wait for the subjects of modern and arguably better-designed longitudinal studies (e.g., Pittsburgh Youth Study; Rochester Youth Development Study; Project on Human Development in Chicago Neighborhoods; Dunedin cohort study) to reach later adulthood in the middle part of the twenty-first century and beyond. But of course, by then, those data too will be criticized as old.

for groups of troubled kids, of course, that claims are made about prediction. There is no point intervening in the lives of model children, and we see no policy move to do so. It is only for the sort of boys represented in the Gluecks' delinquent sample do we see clamoring for "early intervention."

What does this mean for developmental theories that rely on offender typologies with which we began? Do the data leave us on the side of Gottfredson and Hirschi, the criminal careerists, the developmentalists, or some middle ground? We think the answer is more like a "new middle ground" with an emphasis on general theory. Recently, Paternoster et al. (1997) pointed out that the life-course perspective of Sampson and Laub (1993) is in some respects more compatible with general theories like Gottfredson and Hirschi (1990) than with developmental theories, even though the latter are often viewed as synonymous with life-course perspectives. Paternoster and Brame go on to argue, "Gottfredson and Hirschi and Sampson and Laub would predict that the same causal process can be invoked to account for the offending behavior of all individuals" (1997:57).[18] This claim may also be true for social learning theory, general strain theory, and control balance theory.

We emphasize that our work is not a brief against the latent class method *per se*. Groups are useful in managing and presenting data because they reduce complexity. As we have shown, the latent class method appears to capture age heterogeneity in offending trajectories rather well. However, there is a growing trend in criminology to reify such offender groups as distinct rather than approximations or heuristic devices. As Lewontin (2000:4) has cautioned, although metaphors are important in intellectual debates, there is a danger of confusing the metaphor with the phenomenon of real interest. The discipline of criminology would do well to heed this warning, for we may well miss indications that substantively meaningful groups or types do not, in fact, exist. Despite appropriate cautions and caveats, current research thus runs a considerable risk in reinforcing the "metaphorical imagery." Indeed, we believe that statistical approaches for data reduction have seduced some criminologists by giving the appearance of distinct and predictable groupings ("super predator," "life-course-persistent offender," etc.) that are amenable to direct policy intervention (see footnote 1). This is not the fault of the method—proponents (e.g., Nagin, 1999; Nagin and Land, 1993) have warned as much—but rather the user community.[19]

18. For excellent reviews of general vs. developmental and static vs. dynamic criminological theories, see Paternoster et al. (1997:232–240) and Cohen and Vila (1996).

19. However, some statistical work shows that multiple trajectory classes are estimated with non-normal data when only one group exists in the population (Bauer and Curran, 2003).

We are also not arguing that our study was able to assess the validity of the adolescence-limited hypothesis of Moffitt (1993), nor many of her other specific predictions. Much of the testing of her theory requires a population-based sample, and the limitations of our data no doubt conflict with the ideal testing conditions she would prefer. On the other hand, where our data are strong, and perhaps unsurpassed, are in setting up the possibility to examine long-term trajectories of crime and the existence of life-course-persistent offender groups. It would be hard to write an analytic script that would be more conducive to finding troubled adult men than the one laid out in the behavioral story of the delinquent group in the Gluecks' *Unraveling Juvenile Delinquency* (1950). These 500 men generated some 10,000 criminal and deviant offenses to age 70, and yet we have failed to find convincing evidence that a life-course-persistent group can be prospectively or even retrospectively identified based on theoretical risk factors at the individual level in childhood and adolescence. Moreover, even in hindsight (ex post), crime declines with age at the extremes of active offending (cf. Blumstein and Cohen, 1979; Moffitt, 1993: 695). It is difficult to reconcile these findings with the theoretical idea of a life-course-persistent group, which suggests that criminological terminology, if not typological theory, is in need of overhaul.[20] We offer the concept of *life-course desisters* as a cornerstone for this effort, accounting for the apparent fact that all offenders desist but at time-varying points across the life course.

Even if we remain agnostic on whether offender groups are valid in an ontological sense, we can say with some confidence that adult trajectories of offending among former delinquents cannot be reduced to the past. The fact, therefore, remains that there are important differences in adult criminal trajectories that cannot be predicted from childhood, contra the National Summits of the policy world, and apparently much yearning among criminologists.[21]

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20. A number of recent efforts, both empirical and theoretical, have begun to elaborate Moffit's (1993) theory to account for the emerging finding across multiple studies that two groups are not sufficient to describe trajectories of criminal offending (e.g., D'Unger et al., 1998; Katz, 2000; Moffitt et al., 2002; on the statistical side, again see Bauer and Curran, 2003).

21. For an in-depth effort to understand how social processes influence criminal behavior across the full life course, see Laub and Sampson (2003).

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