TRAJECTORIES OF CHANGE IN CRIMINAL OFFENDING: GOOD MARRIAGES AND THE DESISTANCE PROCESS*

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Building on Sampson and Laub (1993), we draw an analogy between changes in criminal offending spurred by the formation of social bonds and an investment process. This conceptualization suggests that because investment in social relationships is gradual and cumulative, resulting desistance will be gradual and cumulative. Using a dynamic statistical model developed by Nagin and Land (1993), we test our ideas about change using yearly longitudinal data from Glueck and Glueck's (1950, 1968) classic study of criminal careers. Our results show that desistance from crime is facilitated by the development of quality marital bonds, and that this influence is gradual and cumulative over time.

When and how do criminal offenders desist? Although the relationship between age and criminal behavior has animated much recent research in criminology, the questions of change in criminal offending and the attendant issue of measuring such change have received little attention. We emphasize the central role of social bonds in the movement away from criminal and antisocial behavior patterns. The emergence of social bonds can be likened to an investment process in that social bonds do not arise intact and full-grown but develop over time like a pension plan funded by regular installments. As the investment in social bonds grows, the incentive for avoiding crime increases because more is at stake. Thus, while seminal events can dramatically alter longstanding patterns of behavior, we expect that desistance from crime will be gradual and will accompany the accumulation of social bonds (Horney, Osgood, and Marshall 1995:671).

Sampson and Laub (1993) pose an age-graded theory of informal social control in which social bonding in the form of strong ties to work and family plays an important role in the movement away from crime for previously criminal youths. They find that individuals who desist from crime are significantly more likely to have entered into stable marriages and steady employment (see chaps. 7 and 8). Thus, Sampson and Laub contend, marriage and work act as "turning points" in the life course and are crucial in understanding the processes of change.

We emphasize that turning points are "triggering events" that are, in part, exogenous—that is, they are chance events. If these events were entirely the result of conscious calculations or enduring patterns of behavior, we could not argue for the independent role of social bonds in shaping behavior. It could be argued, for example, that the association between desistance and adult social bonds is instead attributable to a selection process (Gottfredson and Hirschi 1990). A large body of research documents an association between enduring individual characteristics—low intelligence and impulsiveness, for example—and criminality. The distribution of these persistent individual differences, which

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we call persistent heterogeneity, is highly skewed right (Nagin and Paternoster 1991). It may be that those who desist from crime as young adults are in the middle range of the skewed tail: They are sufficiently prone to crime to be delinquent and unattached in their youth, but not so crime-prone to persist in their criminality and detachment in their adult years. Although we do not fully accept this rather deterministic view of human destiny (and its attendant optimism about the ability to predict adult outcomes from childhood patterns), our empirical analyses must address this argument.

Here we move beyond Sampson and Laub's prior work (1993; Laub and Sampson 1993). First, we test their predictions using a dynamic statistical model drawn from Nagin and Land (1993; also see Land, McCall, and Nagin 1996). Sampson and Laub's analyses to date have used mainly "static" tests, albeit with longitudinal data, in which behavior at one time is related to variables measured in prior periods. This strategy establishes causal order, but it does not capture the progression of change. Here we examine multiple periods of behavior that capture not only the cumulative impact of change but the time path by which change is achieved.

Second, we explicate the underlying process of social bonding over the life course. A change in criminal trajectory does not necessarily result from marriage and work alone. Rather, it is a response to an enduring attachment that emerges from entering into a marriage or a job. Here we build on Laub and Sampson (1993:310–11) and Nagin and Paternoster (1994:586–88) who liken the emergence of social bonds to an investment process. This theoretical viewpoint has implications for the underlying dynamics of the desistance process: Unlike the criminal careers paradigm, in which desistance is modeled as abrupt, we anticipate a gradual movement away from criminal offending.

Third, we show that individual characteristics and family circumstances measured in childhood that are known to predict delinquency and adult criminality have a limited capacity to predict desistance. This further supports our contention that adult social bonds are important in understanding changes in criminal trajectories.

DATA AND METHODS

We analyze the criminal histories of 500 delinquent boys who were followed into adulthood by Glueck and Glueck (1950, 1968). The Gluecks' prospective study of the formation and development of criminal careers was initiated in 1940 and also included a control group of 500 nondelinquent boys. As our interest is in desistance from crime, we exclude the Gluecks' nondelinquent sample from our study.

The data collection process took place over 25 years, from 1940 through 1965. After an initial interview at age 14 (on average), subjects were followed up at ages 25 and 32. The data were collected using a multimethod strategy that included interviews with the subjects and their families and with key informants such as social workers, school teachers, neighbors, employers, and criminal justice officials (Glueck and Glueck 1950: 41–53). Interview data were supplemented by field investigations that gathered information from the records of public and private agencies. These data verified and amplified the case materials collected during the interviews (Glueck and Glueck 1950, 1968; Sampson and Laub 1993).

Key Measures

The following measures covering childhood, adolescence, and adulthood were selected (Sampson and Laub 1993:47–63; Sampson and Laub 1994:530–31).

Individual differences. Measures of individual differences include verbal intelligence, personality traits, and childhood behaviors. *Verbal intelligence* was assessed using the Wechsler-Bellevue IQ test; scores were coded into eight categories ranging from 1 (120 and above) to 8 (59 and below). The mean verbal IQ score for the delinquent sample was 88.6 (Glueck and Glueck 1950:356).

From psychiatric assessments we used four dichotomous variables that tap *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 *childhood behaviors* we used a dichotomous indicator based on teachers'

and parents' reports that the subject engaged in violent and habitual temper tantrums while growing up. Another measure of childhood behavior (difficult child) indicated whether the subject was overly restless and irritable.

Family differences. Included here are *family poverty* (indicated by a combination of low income and reliance on public assistance), *family size* (number of children), and *parental criminality and alcohol abuse* (determined from official records and interview data). In addition, we used three measures of family process—*parental style of discipline*, *mother's supervision*, and *parent-child attachment*. Parenting style was measured by summing three variables describing the discipline and punishment practices of mothers and fathers to create a measure that combined mother's and father's discipline—*erratic/harsh discipline*.

Adolescent behavior. *Antisocial conduct in adolescence* was measured in two ways. One indicator is the *average annual frequency of arrests* up to age 17 while not incarcerated. A second measure is a composite "unofficial" scale (ranging from 1 to 26) of 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. In addition, we use self-reported *age of onset of misbehavior* to create a dichotomous variable (coded 1 if age of onset is earlier than age 8). Finally, *attachment to school* is a composite measure that combines the boy's attitude toward school and his academic ambition.

Adult criminal behavior. Information on *criminal activity through age 32* was drawn from official criminal histories at the state and national levels.

Adult social bonds. All of the social bond measures were taken from the age-32 interview. *Job stability* is measured by a standardized composite scale of employment status, stability of most recent employment, and work habits. *Attachment to spouse* is a standardized composite scale derived from interview data describing the general conjugal relationship during the follow-up period plus a measure of the cohesiveness of the family unit. (For details, see Sampson and Laub 1993:143–45.)

In addition to *marital status at age 32*, we included a variable from the age 25 interview indicating whether a child was born within seven months of the date of marriage and the birth was not recorded as premature or if pregnancy at marriage is acknowledged by the couple. We label this variable *"shotgun" marriage*.

Measuring Adult Desistance

We anticipate that individuals who enter early into a marriage that subsequently evolves into a strong attachment, hereafter referred to as an "ex-post good marriage," will desist the soonest. Testing this dynamic prediction requires that we operationalize the concept of desistance. Our perspective emphasizes gradual change, that is, we do not expect criminal activity to drop abruptly to zero. Rather we expect a gradual decline toward zero or a very low rate of offending.

Consider two hypothetical offending trajectories. In both trajectories, the individual's rate of offending rises throughout adolescence, reaches a peak at about age 18, and declines thereafter. However, for one individual, the rate of decline is rapid, so that by age 25 his rate of offending is negligible. In contrast, the rate of decline for the second individual is more gradual, so that by age 32 his rate is substantially less than at age 18 but is still far from zero. By any reasonable conception of desistance, the former individual has desisted, but not the latter.

The analytical challenge is to devise a statistical procedure for identifying such distinctive offending trajectories. We use the semiparametric Poisson mixture model (SPMM) (Nagin and Land 1993; also see Land et al. 1996).[1] The model assumes that, during periods of criminal activity, individuals commit crimes according to a Poisson process with rate λ_{it}, where parameter λ_{it} is the expected rate of crime commission for that individual in that period. A graph of individual i's λ_{it} over time specifies that individual's offending trajectory.

[1] A detailed discussion of the likelihood function of the semiparametric mixed Poisson regression model and a comparison of its estimates with those from regular Poisson and negative binomial analyses can be found in Land et al. (1996).

Nagin and Land (1993) approximate the limitless heterogeneity in possible offending trajectories with a finite number of distinctive groups that vary not only in terms of the *level* of offending but also in the *rate of change* in offending over time. To do this the offending trajectory for each group is assumed to be a quadratic function of age:

$$\ln\left(\lambda_{it}^{j}\right) = \beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2, \qquad (1)$$

where superscript j denotes group j, age_{it} is individual i's age in period t, and age^2_{it} is i's age squared in period t.[2] Note that all of the parameters of the quadratic function are group-specific. This allows groups to have distinctive offending trajectories in terms of both level and pattern of change over time. The larger the group's constant term, β_0^j, the higher its "base" offending rate. The parameters β_1^j and β_2^j define the shape of the trajectory.[3]

An example illustrates how the estimation procedure extracts the group-specific trajectories and their proportional representation in the population. Suppose there are two distinct groups in the population: (1) youthful offenders who make up 50 percent of the population and who, up to age 18, have a λ of 5 and after age 18 have a λ of 1; and (2) adult offenders who make up the other 50 percent of the population, whose offending trajectory is the reverse of that of the youthful offenders—through age 18 their λ equals 1 and after age 18 their λ increases to 5.

Suppose these data are analyzed under the assumption that the age to λ trajectory was identical across all individuals. The estimated value of λ would be a "compromise" estimate—about 3 for all ages. From this value we would mistakenly conclude that in this population the rate of offending does not vary with age. If the data are analyzed using the SPMM, which specifies the likelihood function as a mixing distribution, this mathematical "compromise" would not be necessary. The parameters of one component of the mixing distribution would accommodate (i.e., match) the youth offending portion of the data in which offending declines with age, and another component of the mixing distribution would accommodate the adult offender data in which offending increases with age.

Controlling for Enduring Individual Differences

There is a strong bivariate association in the Gluecks' data between desistance and the formation of strong marital bonds. This association may reflect the preventive effect of marriage or it may be an artifact of a selection process. The criminally active who eventually desist may represent individuals with a low level of "criminal propensity." In the parlance of Gottfredson and Hirschi (1990), the desisters are individuals with comparatively more self-control, or in the Moffitt (1993) taxonomy, they are "adolescent-limited" offenders. According to either theory, desisters are more likely than nondesisters to form strong marital bonds, but not because desistance and strong marital bonds are causally related. Rather the association reflects enduring individual differences that are causes of both desistance and the formation of a strong marriage.

To control for such enduring individual differences we use SPMM's ability to identify which group trajectory best matches an individual's offending history. While an individual's offender-group membership cannot be determined definitively, individuals can be sorted among offender categories based on the probability of their belonging to the various groups. Based on the model coefficient estimates, the probability of observing each individual's longitudinal pattern of offending is computed conditional on his belonging to each group. The individual is then assigned to the group with the highest ex-post probability of having generated his observed pattern of offending. For each individual i, the probability of his belonging to group j is:

$$P\left(j|y_i,x_i\right) = \frac{P\left(y_i|j,x_i\right)\pi_j}{\sum_j P\left(y_i|j,x_i\right)\pi_j}, \qquad (2)$$

[2] A log-linear relationship between λ_{it} and potential covariates is assumed to ensure that a basic assumption of the Poisson distribution, $\lambda > 0$, is fulfilled.

[3] The model also includes a second component called "intermittency," which allows for periods of inactivity within the criminal career. The intermittency component of the model specifies that with probability, π_{it}, individual i in period t will be inactive and thus will have no recorded offenses. Intermittency is modeled as a probit that is a quadratic function of age.

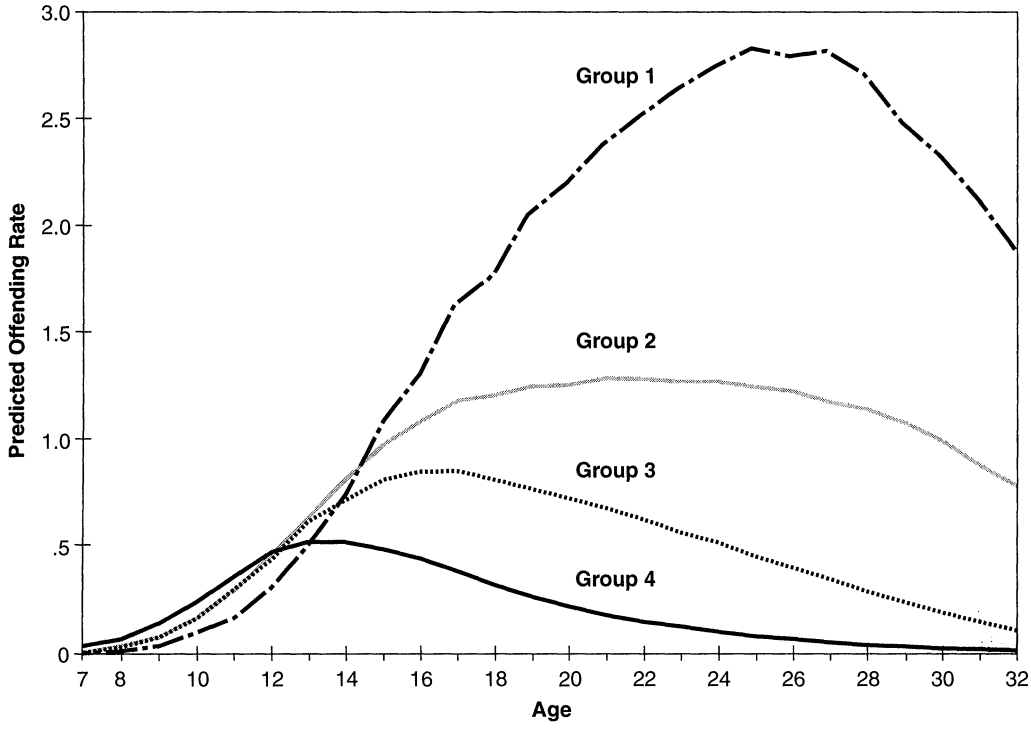

Figure 1. Predicted Offending Trajectories, by Age

where y_i is a vector representing a count of individual i's arrests in each period t and π_j is the estimated proportion of the population in each group j.

These group assignments control for enduring individual differences in two ways. They serve as control variables in regressions that analyze the link between the timing of entry into an ex-post good marriage and the timing of the decline in offending. They also identify subsamples of individuals with similar offending trajectories. Within these more homogeneous subsamples, which include groups that show the strongest evidence of desistance from crime by age 32, we test whether the desistance process was accelerated by early entry into a strong marriage.

RESULTS

Our analysis proceeds in two stages. In the first stage, we apply the SPMM to the delinquent sample of 480 youths in the Gluecks' data.[4] In the second stage of the analysis, we examine the relationship between the timing of marriage and desistance from criminal activity.

First-Stage Analysis

Exploratory analysis suggested that a four-group model best fit the data.[5] Figure 1 shows the four offending trajectories identified by the model. Although individuals in this sample were selected on the basis of their being active delinquents in their youth, by age 32 the distribution of their offending mirrors that of the general population—it is skewed right. Group 1 is a small but promi-

[4] Unfortunately, the original records for 20 cases were lost in the process of archiving, leaving 480 cases available for our analysis. Previous analyses revealed nothing unusual about these 20 lost cases (Sampson and Laub 1993).

[5] Although there is no definitive statistic for determining the optimal number of groups, the Bayesian Information Criterion (BIC) provides a good benchmark (D'Unger et al. 1996). By this criterion, the four-group model improves on a three-group model. As the five-group model was not estimable, we concluded that the four-group model was best. The parameter estimates of the model are available from the authors on request.

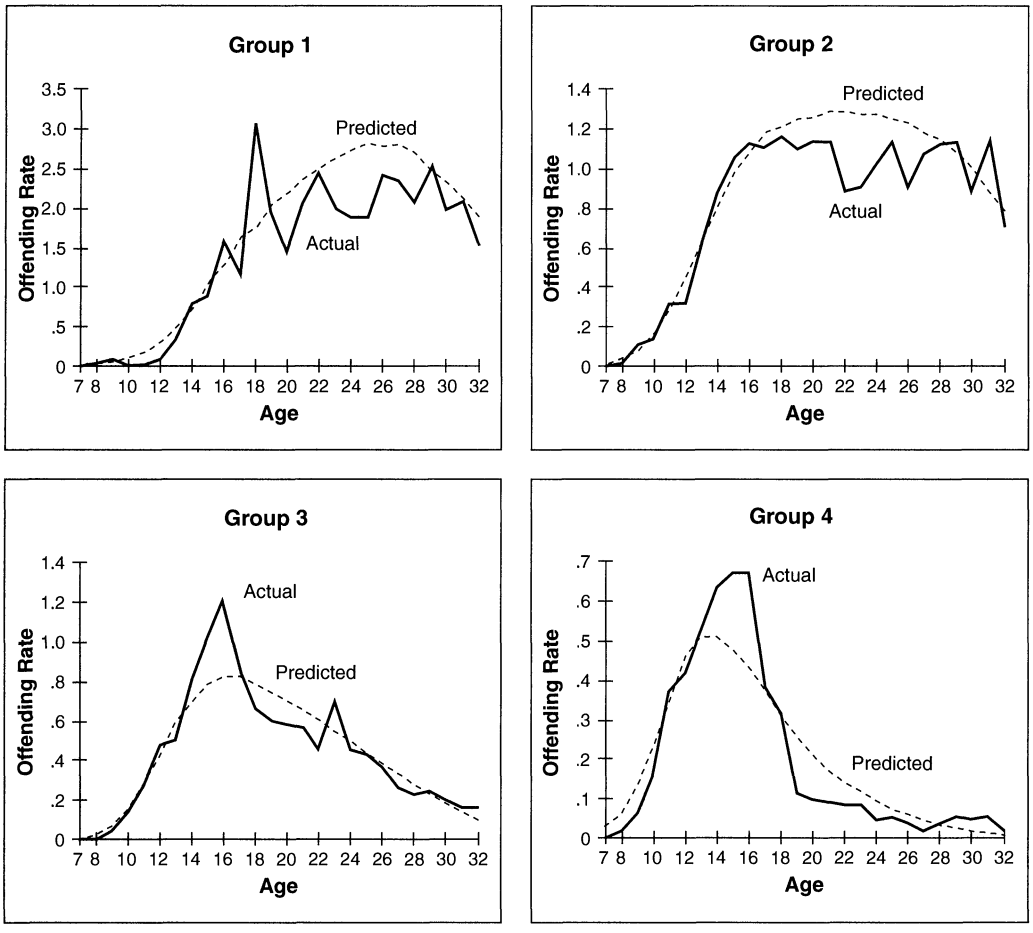

Figure 2. Actual and Predicted Offending Rates by Age, for Groups

nent group of high-rate chronic offenders. Based on the maximum probability rules described above, only 11 individuals were assigned to this group. Another 95 individuals were assigned to Group 2, which includes chronic offenders who offend at a more modest rate. Finally, Groups 3 and 4 constitute the largest share of the sample, 220 and 154 individuals, respectively. These individuals have either effectively desisted or are near desistance by age 32.

Figure 2 compares the actual and predicted offending trajectories for each group. The correspondence between actual and predicted is generally close for all four groups.

Group 1 includes individuals who remain high-rate offenders throughout the adult observation period. Their peak average offending rate of nearly 3 arrests per year occurs at age 25 and declines only to about 2 arrests per year by age 32. This group constitutes only a small percentage of the sample—2.8 percent based on the model's parameters. Group 2 also is comprised of individuals who can be characterized as chronic offenders. This group, which accounts for an estimated 25.7 percent of the sample, differs from Group 1 only in degree: Through the adult years the estimated average offending rate of Group 2 is about 60 percent of that of Group 1. Otherwise Group 2's offending trajectory mirrors that of Group 1, reaching a peak at about age 25 and slowly declining thereafter. But even at age 32, those in Group 2 average about .8 arrests per year.

Groups 3 and 4 are the largest groups making up an estimated 42.5 percent and 28.9 percent of the sample, respectively. While both groups have modestly high rates of offending through their teenage years, by age

Table 1. Comparison of Group Means for Selected Characteristics, by Group Membership

Characteristic	Groups 1 and 2	Group 3	Group 4
Individual Differences in Childhood			
Verbal IQ	5.63	5.49	5.44
Percent extroverted	67.0	53.1	55.8
Percent adventurous*	66.0	52.7	50.6
Percent egocentric	12.3	15.9	9.7
Percent aggressive	14.2	15.9	15.6
Percent tantrums	44.3	41.4	34.4
Percent difficult	55.8	60.9	57.9
Family Differences in Childhood			
Poverty	.10	.08	.00
Family size*	6.00	5.34	5.23
Parental crime/alcohol abuse	2.06	1.94	2.04
Erratic discipline	.13	−.15	−.08
Supervision	1.39	1.47	1.42
Attachment to family	3.07	3.13	3.10
Adolescent Behavior			
Arrest frequency*	.45	.45	.37
Unofficial delinquency*	15.6	14.0	13.6
Percent attached to school*	21.6	35.9	39.7
Percent early onset	15.4	14.1	9.6
Adult Social Bonds			
Percent divorce/separation by age 32*	38.5	18.9	10.3
Percent "shotgun" marriage*	40.8	34.4	18.4
Percent married by age 32*	30.8	50.7	80.3
Quality of marriage at age 32*	−2.01	−.47	.69
Job stability at age 32*	−3.16	−1.37	.50
Number of Cases	106	220	154

* Differences are jointly significant at $p < .05$ level (see footnote 6).

32 the average arrest rates are small: For Group 4 it approaches 0 (.02 arrests per year). Figure 1 indicates that effectively this group had desisted from offending for nearly a decade. At age 32 the estimated offending rate of Group 3 is only .1 arrests per year, which implies an average time between arrests of about 10 years. The effective desistance of Group 3 members by age 32 appears to have occurred more gradually than that for Group 4 members, as throughout their twenties those in Group 3 have modestly high arrest rates.

Table 1 presents group means on a variety of individual characteristics, behaviors, and life-course outcomes. We combine Groups 1 and 2 because of the small numbers in Group 1. Consider first the "unofficial" delinquency measure under "Adolescent Behavior." Although Groups 1 and 2 had more adolescent delinquent activity than did members of Groups 3 and 4, the difference is modest—15.6 for Groups 1 and 2 versus 14.0 for Group 3 and 13.6 for Group 4.[6] Thus, *condi-*

[6] Significance tests are based on a likelihood-ratio test of whether the group membership variables add significantly to the explained variation in the response variable. This test assumes that group assignments are made without error. They are not. However, group assignment probabilities,

tional upon having a juvenile record, the intensity of adolescent delinquency seems to be only moderately predictive of eventual desistance. This important point is often overlooked in discussions of desistance from crime in adulthood.

The variables measuring individual and family differences in childhood were selected because research on the Gluecks' data (Sampson and Laub 1993) as well as on other data (Loeber and Stouthamer-Loeber 1986; Nagin and Farrington 1992; Nagin, Farrington, and Moffitt 1995) has shown that these childhood factors predict juvenile delinquency, and in some instances, predict adult criminality. Our concern, however, is with desistance.

Only family size distinguishes the groups—on average the desisters come from somewhat smaller families, 5.5 and 5.2 for Groups 3 and 4, respectively, versus 6.0 for Groups 1 and 2. None of the other variables measuring family factors—poverty, parental criminality, and childrearing practices—distinguish the groups; only one of the individual characteristics—whether the boy was judged "adventurous"—differentiates the groups. The percentages of subjects who in childhood were extroverted, egocentric, aggressive, difficult, or prone to temper tantrums all fail to differentiate the Group 1 and 2 nondesisters from the two desister groups. We suspect that the limited capacity of these childhood factors to differentiate group membership stems from the relatively small differences across groups in the intensity of their adolescent delinquency. Put differently, while prior research has shown that childhood and family differences are "sturdy" predictors of antisocial behavior (Robins 1978), the capacity of these differences to predict future desistance from such behavior seems to be limited. Nagin et al. (1995) also found that these variables had a limited capacity to predict desistance among active offenders in a more contemporary sample of 411 British males born in 1951–1954.

according to the maximum probability rule, are typically very high. When this is the case, inferences are scarcely affected by formal correction for assignment uncertainty (Roeder, Lynch, and Nagin 1997).

Table 2. Coefficients from Regressions of the Marriage Quality Index Scores on Unofficial Delinquency and Group Membership

Independent Variable	Model 1	Model 2
Unofficial delinquency	$-.055^{*}$	$-.004$
	(-2.08)	$(-.17)$
Groups 1 and 2 membership	—	-2.685^{**}
		(-9.54)
Group 3 membership	—	-1.154^{**}
		(-5.04)
Constant	.362	$.742^{*}$
	(.93)	(2.07)
R^2	.01	.34
Number of cases	311	311

Note: Numbers in parentheses are *t*-ratios.
$^{*}p < .05$ $^{**}p < .01$ (two-tailed tests)

The variables measuring adult social bonds show that desister groups (Groups 3 and 4) are significantly and substantially less likely to be divorced or separated or to have been involved in "shotgun" marriages. They also have significantly higher scores on two indices of social bonds—the quality of the marriage bond at age 32 for those who are married and job stability for the period from age 25 to 32.

The pronounced association between membership in Group 3 or 4 and the strength of adult social bonds is consistent with our view of change over time; but it is also consistent with a selection process view. Table 2 illustrates the potential selection problem. Model 1 shows a regression of the marriage quality index at age 32 on our measure of "unofficial" delinquency. There is a pronounced negative association between the intensity of unofficial delinquency and this index of a good marriage—those with fewer delinquent acts as reported by various informants tend to have more successful marriages, a result consistent with the past-as-prologue-to-future argument that underlies the selection interpretation of the desistance-social bond association. However, once group membership controls are entered into the regression (Model 2), the association between the intensity of delinquency and the good marriage quality index is reduced to zero. This result is strong evidence that us-

ing group membership as a control effectively takes into account enduring individual individual differences.

Second-Stage Analysis

In the second stage of our analysis, we test two key predictions on gradual change: (1) Individuals who early on become involved in marriages that evolve into good marriages will desist from crime the soonest, and (2) as a result of the growing investment in ex-post good marriages, the magnitude of the preventive effect of the marital bond will grow over time.

In the Poisson regression analyses that follow, the dependent variable is the number of arrests of individual i in period t, where periods are defined as two-year intervals beginning with age 17 and ending at age 32 (i.e., i = 17–18, 19–20, . . . , 31–32). Independent variables include dummy variables for age for each period, which control for changes in offending due to the effect of "age" (Hirschi and Gottfredson 1983). To control for persistent heterogeneity, the model specification also includes the individual's juvenile arrest frequency rate *and* dummy variables indicating group membership.[7]

The key component of the specification for testing our hypotheses concerning the preventive effect of the marriage bond is a series of period dummy variables designed to capture the impact of the quality and timing of the marriage on the offending rate. To illustrate, for an individual who marries in the 23–24 age period, his dummy variable for "marriage period" equals 1 in the period of the marriage (age 23–24 in this example) and 0 in all other periods. The dummy variables "one period before marriage period" and "two periods before marriage period" are, respectively, set equal to 1 in the first and second periods prior to the marriage. Similarly, the dummy variables for one, two, and three periods after the marriage are set equal to 1 in the first, second, and third periods following marriage, respectively. The model also includes a companion set of dummy variables that in a similar manner distinguish the timing of ex-post good marriages, defined by having a marriage quality score at age 32 greater than the sample median.

Our model emphasizes that the preventive effect emanates from the quality of the marriage bond, not from the existence of marriage itself. Thus, we do not expect any systematic relationship between the timing of the marriage and the offense rate as captured by the coefficients for the marriage period dummy variables. In contrast, we anticipate that the coefficients for the good marriage period dummy variables will display a pattern suggesting an enduring and growing preventive effect. In other words, all of the good-marriage coefficients will be negative and their absolute magnitudes will increase from the onset of the good marriage forward. This prediction captures our argument that ex-post good marriages have a preventive effect dating from the initial period of the marriage onward, and that the preventive effect will grow with time. We make no predictions about the signs of the coefficients for the one and two periods before a good marriage, but if there is a preventive effect stemming from courtship, the coefficients will also be negative for the courtship period.

The results are reported in Table 3. Observe that the group membership coefficients are large and significant. All of the coefficients of the dummy variables in the model can be interpreted as the natural logarithm of the proportional difference from a reference group. For the group membership variables, the reference group is Group 4. Thus, in any given period, members of Groups 1 and 2 have mean arrest rates 14 times larger than their Group 4 counterparts. Similarly, the Group 3 arrest rate is estimated to be 5 times larger. Note, however, that the arrest rates for Group 4 members are very small by their mid-twenties so that these large multiples exaggerate the absolute difference in the offending rate, particularly in the case of Group 3. Not surprisingly, the coefficients of the dummy variables for age also imply a steady decline in the expected arrest rate from age 17 onward.

The coefficients for the marriage-timing dummy variables measure the preventive im-

[7] We also conducted the analyses including both juvenile arrest frequency and unofficial delinquency in the models. The results were virtually identical.

Table 3. Coefficients from Poisson Regressions of Arrest Rate on the Timing and Quality of Marriage

Independent Variable	Estimate	*t*-Ratio
Marriage period – 2	.036	(.50)
Marriage period – 1	–.072	(–1.00)
Marriage period 0	–.212**	(–2.62)
Marriage period + 1	–.029	(–.37)
Marriage period + 2	.115	(1.43)
Marriage period + 3	.378***	(4.81)
Good-marriage period – 2	–.024	(–.19)
Good-marriage period – 1	–.202	(–1.41)
Good-marriage period 0	.332**	(2.67)
Good-marriage period + 1	–.216	(–1.57)
Good-marriage period + 2	–.860***	(–4.76)
Good-marriage period + 3	–1.154***	(–5.87)
Groups 1 and 2	2.610***	(30.04)
Group 3	1.630***	(18.88)
Age at Marriage		
17 to 18	.667***	(8.78)
19 to 20	.448***	(5.58)
21 to 22	.481***	(5.79)
23 to 24	.475***	(5.87)
25 to 26	.355***	(4.29)
27 to 28	.213**	(2.53)
29 to 30	.139	(1.61)
Juvenile arrest	.010	(.13)
Constant	–2.021***	(–19.18)
Number of observations	2,799	

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)

pact of marriage alone.[8] For these variables the reference group is "not married." The estimates suggest an initial preventive effect—the coefficient for the period of marriage is negative and significant, but for periods after the marriage the coefficients change sign and become positive, implying that marriage alone may even increase crime. Indeed, by three periods after marriage the increase is statistically significant. Likelihood-ratio tests show that the six marriage-timing variables add significantly to the explanatory power of the model ($\chi^2 = 35.2$, d.f. = 6).

We turn now to the results concerning the preventive effects of ex-post good marriages. The coefficients for one and two periods before a good marriage are both negative, suggesting a courtship effect, but neither is statistically significant. The results for the periods after a good marriage accord with our prediction but with one important exception. In all of the periods following an ex-post good marriage there is a significant preventive effect that increases over time. By construction, the coefficient estimates measure the preventive effect of a good marriage compared to marriage alone. Thus, the reference group is individuals who entered into marriages that were evaluated as "not-good" by the marriage quality index. The results imply that in the first period after marriage, persons who enter into an ex-post good marriage have an offending rate that is 19 percent less than a person who is one period into an ex-post "not-good" marriage. By the second period after marriage, this difference grows to 58 percent, and by the third period the difference is an even more substantial 68 percent. These estimates suggest that the influence on offending of a strong marital bond is large and that influence increases over time. The exception to the predicted pattern occurs in the initial period of the good marriage. The results show a positive and significant increase in the expected arrest rate of nearly 40 percent compared to entry into an ex-post "not-good" marriage.

Another natural reference category for calibrating the impact of a good marriage is no marriage. This impact can be obtained by summing the period-specific coefficients for marriage and good marriage (e.g., one period after marriage and one period after good marriage). Table 4 reports these results using the reference groups of "not married" and "not good marriage" alone. The results are not substantially sensitive to the choice of reference group. When "not married" is the reference group, there is no statistically significant initial period increase in crime and the post-marriage preventive effect grows over time. When "not good marriage" is the reference group there is an initial increase in

[8] Because the model specifically distinguishes ex-post good marriages, the marriage-alone impact estimates can also be interpreted as measuring the impact of an ex-post "bad" marriage as evidenced by a marriage quality score below the sample median.

Table 4. Magnitude of the Good-Marriage Effect: Percentage Difference from Reference Group, by Marriage Period

Period	Reference Group: Not Married	Reference Group: "Not-Good" Marriage
Good-marriage period – 2	1.2	2.4
Good-marriage period – 1	–24.0	–18.3
Initial good-marriage period	12.7	39.4
Good-marriage period + 1	–21.7	–19.4
Good-marriage period + 2	–52.5	–57.7
Good-marriage period + 3	–53.8	–68.3

crime, but by the first period after marriage there is a preventive effect that thereafter grows large. The insensitivity of the results to choice of reference group is another reflection of the finding that marriage alone seems to have no enduring preventive effect.

Table 5 reports regression results similar to those in Table 3, but for each group separately. Holding constant the degree of desistance by age 32 provides further protection from selection biases contaminating our test of the preventive effect of a good marriage. The results for Group 3 mirror the findings for the combined sample: There is evidence of a short-term preventive effect of marriage alone, but no enduring impact. Also, as in the combined sample, there is a growing preventive effect of a good marriage. While the estimated decline in arrests in the first period after a good-marriage is not statistically significant, the magnitude of the point estimate of the "good-marriage effect" is still substantial—a 21-percent decline compared to entry into an ex-post not-good marriage. The effects for two and three periods after a good marriage are statistically significant and resemble the estimated preventive effects for the full sample, 50-percent and 64-percent declines, respectively. The coefficient of the initial good-marriage period remains positive and substantial in magnitude, a 75-percent increase.

The results for Group 4 are qualitatively similar, but the good-marriage effect is significant only in the second period after the good marriage. The weaker results are likely attributable to the rapid decline in arrest rates that all members of this group experience beginning in their late teenage years. Because this decline occurs prior to the age that most married, it is difficult to measure the impact of marriage on offending for Group 4.

Finally, the combined Groups 1 and 2 consist of individuals who even at age 32 continued to have moderate-to-high arrest rates. Still, by age 32 their rates of offending have declined by about 30 percent to 40 percent from their peaks at age 25 (see Figure 1). While Table 1 shows that chronic offenders are significantly less likely to enter into ex-post good marriages than were desisters, some did enter into good marriages. The regression results for the combined Groups 1 and 2 suggest that even for these individuals, ex-post good marriages hasten the decline in offending. By the third period after an ex-post good marriage, the offense rate of these chronic offenders is 61 percent smaller than it would have been had their marriage not been good. This finding is compatible with the analyses of the criminal careers of convicted felons by Horney et al. (1995), who found that the behavior of even highly deviant actors is amenable to change. Some criminals *do* marry, and some of these marriages reduce propensities to offend.

In another test of our hypotheses we not only divided the sample by group but also included only individuals who entered into ex-post good marriages. This sample division creates homogeneity at age 32 in both the degree of desistance *and* the quality of the marriage bond and offers a still more demanding test of whether a quality marital bond hastens desistance. For this regression, there is no evidence of a courtship effect for any of the subsamples, and for each subsample the good-marriage period and one period after good marriage effects are positive but not significant (results available on request). However, the effects two and three periods after a good marriage effect are negative for each subsample. Although not significant by conventional criteria, this lack of significance appears to be largely attributable to a loss of statistical power, because the magnitudes of the coefficients are reasonably large. In fact, for Group 4 and Groups 1 and 2, the results imply that their arrest rates were about 40 percent smaller than those for

Table 5. Coefficients from Poisson Regressions of Arrest Rate on the Timing and Quality of Marriage, by Group Membership

	Groups 1 and 2		Group 3		Group 4	
Independent Variable	Estimate	*t*-Ratio	Estimate	*t*-Ratio	Estimate	*t*-Ratio
Marriage period – 2	.141	(1.52)	–.110	(–.86)	.014	(.04)
Marriage period – 1	.020	(.23)	–.205	(–1.50)	–.054	(–.13)
Marriage period 0	–.081	(–.80)	–.508***	(–3.29)	–.074	(–.14)
Marriage period + 1	–.011	(–.12)	–.099	(–.73)	–.509	(–.69)
Marriage period + 2	.084	(.82)	.153	(1.11)	.290	(.54)
Marriage period + 3	.358***	(3.74)	.403**	(2.82)	.226	(.37)
Good-marriage period – 2	–1.066*	(–2.34)	.013	(.08)	.095	(.22)
Good-marriage period – 1	–.393	(–1.14)	–.182	(–.90)	–.321	(–.65)
Good-marriage period 0	.035	(.13)	.559**	(2.93)	.542	(.99)
Good-marriage period + 1	.263	(1.23)	–.238	(–1.18)	.004	(.01)
Good-marriage period + 2	–.686*	(–2.08)	–.693**	(–2.90)	–1.437	(–1.88)
Good-marriage period + 3	–.939**	(–2.87)	–1.029***	(–3.56)	–.721	(–.98)
Age at Marriage						
17 to 18	.135	(1.35)	1.351***	(9.60)	1.760***	(4.97)
19 to 20	.108	(1.04)	1.069***	(7.34)	.653	(1.62)
21 to 22	.161	(1.48)	1.074***	(7.15)	.657	(1.59)
23 to 24	.105	(1.02)	1.154***	(7.79)	.362	(.81)
25 to 26	.106	(1.03)	.850***	(5.56)	.441	(.99)
27 to 28	.227*	(2.28)	.279	(1.67)	–.255	(–.51)
29 to 30	.102	(.98)	.216	(1.27)	.357	(.85)
Juvenile arrest	–.049	(–.46)	.099	(.89)	.047	(.12)
Constant	.831***	(9.28)	–.874***	(–6.39)	–2.394***	(–6.83)
Number of observations	627		1,261		914	

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)

their counterparts who had not yet entered into the courtship phase of their ex-post good marriage. The estimate for Group 3 is 26 percent smaller. To be sure, the patterns are somewhat erratic, but we are encouraged to find even tentative support for our hypotheses about change in such a highly restricted sample with reduced variation.[9]

[9] We replicated the main analysis disaggregating crime into the two major crime types—violent crimes and property crimes. For both types of crime, good marriage has a significant lagged preventive effect on offending (two years out for violence and three years out for property crime), net of group membership, age, and juvenile arrests. Furthermore, marriage alone has no effect on desistance independent of its quality.

CONCLUSION AND IMPLICATIONS

Several conclusions flow from our analyses. First, there are distinct trajectories of individual offending that diverge markedly from the aggregate age-crime curve. Four offender groups characterize the delinquent sample from Glueck and Glueck (1950). Although two of these groups follow the conventional age-crime curve with sharp declines in offending in adulthood (Farrington 1986; Hirschi and Gottfredson 1983), two groups do not. In fact, at least one group and probably a (small) second group of men continue to offend at a fairly high and relatively flat rate even as they age into their thirties. These findings emerge from a group of high-

rate juvenile offenders. The delinquents in the Gluecks' study were serious, persistent offenders, and consequently, they were remanded to juvenile institutions. Yet as they age, the heterogeneity in offending patterns becomes sharper, so that by age 32 the skewness of offending that we observe in general population samples is evident in this group too (albeit at a higher level of overall offending).

The second finding, implied but not compelled by the first, is that childhood and juvenile characteristics are insufficient for predicting the patterns of future offending in a high-rate group of juvenile offenders. The divergent pathways that unfold over time can be predicted by concurrent events in the transition to young adulthood. Recall that many of the staple variables of delinquency theory (e.g., being a difficult child, low IQ, living in poverty, poor parental supervision) were unable to differentiate offending trajectories into mid-adulthood. These findings suggest that many of the classic predictors of the onset and frequency of delinquency may not explain desistance.

The third major finding concerns the timing and quality of marriage: Early marriages characterized by social cohesiveness led to a growing preventive effect. Consistent with the informal social control theory of Sampson and Laub (1993) and Nagin and Paternoster (1994), the data support the investment-quality character of good marriages. The effect of a good marriage takes time to appear, and it grows slowly over time until it inhibits crime. Our findings accord well with studies using contemporary data. For example, Horney et al. (1995) showed that large *within-individual* variations in criminal offending for a sample of high-rate convicted felons were systematically associated with local life circumstances (e.g., employment and marriage). As they noted, *some* of the time, *some* high-rate offenders enter into circumstances like marriage that provide the potential for informal social control. When they do, and in our case when marital unions are cohesive, the investment has a significant preventive effect on offending (Farrington and West 1995). "Good" things sometimes happen to "bad" actors, and when they do desistance has a chance. Of course, our perspective suggests that outcomes are always in doubt, but that is even more reason not to give up hope based on negative returns from the early years alone.

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