Crime in Emerging Adulthood: Continuity and Change in Criminal Offending

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FINAL REPORT

Approved By: _____

Date: 2/2/01

Acknowledgements: Support for this research was made possible from a grant from the Department of Justice, National Institute of Justice, 1999[redacted]-IJ-CX-0058. Please address all correspondence to: Alex Piquero, Northeastern University, College of Criminal Justice, 360 Huntington Avenue, Boston, MA. 02115.

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ABSTRACT

The extent to which local life circumstances influence criminal offending has been the focus of much theoretical debate. Some criminologists contend that the relationship between local life circumstances and criminal offending is spurious because the relationship can be explained by individual differences. Other criminologists argue that local life circumstances exert a meaningful effect on criminal offending, even after controlling for individual differences. Although empirical research has been initiated in this regard, it has been limited in several respects. Herein, we use data on 524 serious offenders from the California Youth Authority for a seven-year post-parole period to examine the relationship between changes in local life circumstances (marriage, employment, drug use, alcohol use, street time) and criminal offending. In particular, we extend previous research by developing and applying an empirical model that accounts for the joint distribution of violent and non-violent criminal offending during the late teens and twenties. In so doing, we are able to present information on patterns of criminal activity during a newly recognized developmental period of the life course, 'emerging adulthood'.

INTRODUCTION

Theoretical debate over the fundamental processes leading to continuity and change in offending behavior continues to generate significant amounts of empirical research on criminal careers (Hirschi and Gottfredson, 1995; Sampson and Laub, 1995; Horney et al., 1995; Nagin and Paternoster, 2000; Tremblay et al., 1999; Simons et al., 1998; Wright et al., 1999). Despite there being a number of theories offering credible explanations for offending continuity, there exists a fundamental disagreement over whether the processes generating offending stability reflect social mechanisms or stable propensities to offend.

In Sampson and Laub's theory of age-graded informal social control (1993, 1995), criminal behavior is believed to originate when informal social controls are weakened. According to these scholars, offending continuity reflects a process of cumulative continuity in which the responses to offending behavior amplify opportunities for deviance and additionally knife off opportunities for participation in informal social control mechanisms that could lead to changes in criminal offending. Thornberry's interaction theory (1987) advances a similar argument as he observes that offending behavior has consequences for social control mechanisms such that prior offending further weakens already fractured social ties that further increase the likelihood of future deviance. As can be observed, these approaches allow for events external to the individual to influence criminal offending. In sum, these scholars, although certainly not dismissing the importance of continuity in offending, advance a 'dynamic' approach friendly to the prospect of change and that such change exerts a true effect on the trajectory of criminal offending (i.e., a state-dependence argument) (Nagin and Paternoster, 1991).

These theories differ markedly from 'latent trait' or criminal propensity explanations for

offending stability. The main proponents of this position, Gottfredson and Hirschi (1990, 1995) advance the notion that the well established association between past and future offending behavior reflects an underlying stable propensity toward offending behavior across the life-course. These theorists also contend that events external to the individual do little to influence criminal offending. This 'static' viewpoint argues that stability in criminal behavior over the life-course is due to population heterogeneity that is established early in life and remains relatively stable over the life course (Nagin and Paternoster, 1991).[1]

Similar levels of disagreement also exist over the processes generating change in offending careers. For example, Sampson and Laub's (1993) theory identifies that offender change is highly possible, even for high rate offenders. According to their theory, changing social circumstances in adulthood can impact and redirect criminal trajectories. The development of strong social ties to spouses as well as employment ties (i.e., attachment, commitment, etc.) can further insulate offenders from future offending. In particular, they argue that:

> ...changes that strengthen social bonds to society in adulthood will lead to less crime and deviance while changes in adulthood that weaken social bonds will lead to more crime and deviance" (Sampson and Laub, 1993:21).

While not necessarily discounting offender change (see p.107), Gottfredson and Hirschi (1990) argue that change reflects an invariant "aging out" process common to all offenders,

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[1] Several middle ground positions also currently exist which allow for continuity among certain "types" of offenders, but not others. Moffitt's (1993) life-course persistent and Patterson's (Patterson and Yoerger, 1993) early starter groups provide examples of offender typologies that exhibit stable offending patterns across the life-course whereas Moffitt's adolescence-limited and Patterson's late starter groups represent offending trajectories that are

regardless of sex, race, social class or nationality. Differences between offenders in the timing of change, according to this viewpoint, simply reflects underlying differences in their propensities to offend. In other words, offenders who change simply have lower levels of criminal propensity than offenders who persist.

Although Sampson and Laub and Gottfredson and Hirschi apparently agree that a single theory is sufficient to explain variation in offending behavior throughout the population, in their purest sense, the theories of Gottfredson and Hirschi and Sampson and Laub present clear contrasting interpretations of the widely known positive association between past and future offending behavior (Nagin and Paternoster, 1991) as well as whether changes in informal social control in adulthood materially alter offending behavior. For Gottfredson and Hirschi, the relationship between prior and future offending simply reflects continuity in a stable underlying propensity to offend. Additionally, given this underlying stable propensity to offend, change in offending behavior is unlikely, but certainly not materially affected by changes in informal social control in adulthood. In short, for Gottfredson and Hirschi, life events occurring after childhood/early adolescence are of little explanatory consequence such that marriage, participation in the workforce, and/or other changes in life circumstances and roles have little (if any) impact on patterns of criminal activity.

Sampson and Laub, by contrast, embrace a state dependant interpretation of the relationship between prior and future offending behavior and identify that change is likely even for high rate offenders. Their age-graded theory of informal social control identifies how the development of effective ties to a spouse for example, can bring about desistance. Though some

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marked by change and changing circumstances.

of these changes can be abrupt, the majority are believed to develop incrementally over time (Laub et al., 1998:225). In support of their claim, analyses of the Glueck data revealed that childhood pathways to adult crime were modified by social bonds to adult institutions of informal social control (Sampson and Laub, 1990:625).

Empirical predictions derived from these two theories related to continuity and change in offending behavior are straightforward and Nagin and Farrington's (1992:501) summary is particularly useful. Gottfredson and Hirschi's pure heterogeneity theory would predict that:

> Once relevant time-stable individual differences are established, subsequent individual experiences and circumstances will have no enduring impact on criminal (or noncriminal) trajectories.

Thus, according to Gottfredson and Hirschi (1990:154-168) once controls are introduced for individual differences in propensity, correlations among adult crime and adult experiences (e.g., getting married) should be completely spurious.

This pure population heterogeneity hypothesis can be juxtaposed against a state dependence hypothesis that allows for the causal impact of life events on criminal behavior, even after controlling for individual propensity. As Sampson and Laub (1995:150, emphasis in original) argue:

> ...lives are often unpredictable and dynamic; <u>exogenous</u> changes are ever present. Many changes in life result from chance or random events in individual lives...while other changes in life direction stem from macro-level "exogenous shocks"...Suffice it to say that our theory and analysis suggest that turning points in the adult life course--especially regarding employment, the military, and marriage--predict changes in crime. In other words, there is much intra-individual variability in the adult life-course that, by definition, is not reducible to levels of self-control that remain constant within individuals.

Thus, Sampson and Laub argue that once controls are introduced for individual differences in

propensity or self-control, life circumstances can still exert a causal influence on criminal behavior.

In the current paper, we consider each of these perspectives. In particular, we examine whether levels of criminal activity shift in response to changes in local life circumstances (e.g., marriage, employment, etc.). Our analysis advances prior research on continuity and change in criminal careers in at least three ways. First, we use a prospective longitudinal data set of serious offenders released from the California Youth Authority and followed over a seven-year post-parole period. This particular data set allows for a systematic assessment of relationships between changes in local life circumstances, such as marriage, and changes in offending behavior. An additionally strong feature of the data reflects its ability to control for street time and remove the biases associated with incapacitation (Piquero et al., 2000). Second, we extend previously developed nonparametric statistical models by developing a method that allows us to examine how life circumstances relate to the joint distribution of violent and non-violent offending, which previous research has not yet examined. Third, we examine the extent to which the relationship between life circumstances and criminal offending varies during the late teens through the mid-twenties (Jessor et al., 1991; Moffitt, 1993; Osgood et al., 1996; Sampson and Laub, 1997). Most research on continuity and change in offending does not usually restrict analysis to early adulthood or what Arnett (2000) has termed "emerging adulthood". Importantly, Arnett's work suggests that the period of the life-course between 18 and 25 reflects a distinctive developmental phase characterized by change and a process of exploration of possible life directions:

"Having left the dependency of childhood and adolescence, and having not yet entered the

> enduring responsibilities that are normative in adulthood, emerging adults often explore a variety of possible life directions in love, work, and worldviews. Emerging adulthood is a time of life when many different directions remain possible, when little about the future has been decided for certain, when the scope of independent exploration of life's possibilities is greater for most people than it will be at any other period of the life course" (p. 469).

PRIOR RESEAERCH ON STABILITY AND CHANGE IN OFFENDING

Research on different aspects of criminal careers as well as issues of continuity and change in offending over the life-course has blossomed over the past decade (Paternoster et al., 1997), with research studying various criminal career dimensions including onset (Farrington et al., 1990; Nagin and Smith, 1990; Tibbetts and Piquero, 1999), persistence (Dean et al., 1996; Smith et al., 1991), frequency (Canela-Cacho et al., 1997), specialization (Blumstein et al., 1988; Piquero et al., 1999) and desistance (Shover and Thompson, 1992; Farrington and Hawkins, 1991; Farrington and West, 1995). While research directly focusing on the impact of changes in life events and changes in offending behavior is still emerging, a number of studies provide useful information for the current analysis.

For example, using data from the Cambridge Study in Delinquent Development, Farrington et al. (1986) found that boys had higher crime rates during periods of unemployment than they did during periods of employment. Similarly, Uggen (2000) found that work/employment was a turning point for older, but not younger offenders. That is, older offenders who were given marginal employment opportunities were less likely to re-offend. In a related study, Ouimet and LeBlanc (1996) found that both marriage and employment were associated with desistance among a sample of former juvenile delinquents.

One of the more sophisticated studies on stability and change in offending behavior

conducted by Horney and colleagues (1995) used retrospective life-history data for a sample of over 600 newly convicted offenders sentenced to the Nebraska Department of Correctional Services. The authors used life history calendars to analyze month-to-month variations in offending and life circumstances for a period of 25-36 months. Employing hierarchical linear models to examine within-individual changes, they found that meaningful short-term changes in criminal involvement were strongly related to variation in several forms of local life circumstances. Similarly, Osgood et al. (1996) found that participation in routine activities (i.e., watching tv, going to parties, etc.) was strongly associated with criminal behavior among a five-wave panel of the Monitoring the Future participants.

More recently, Laub et al. (1998) used a semiparametric mixed poisson estimation to examine how investment in marriage related to the desistance process with a sample of 500 white men from Boston, followed from childhood to age 32. Their results suggested that desistance from crime was related to the development of quality marital bonds and that the influence was gradual and cumulative over time.

Research by Warr (1998) presents a contrasting interpretation to that advanced by the Sampson and Laub theory. Using data from the National Youth Survey to explore how changes in marriage and delinquent peers related to desistance from criminal behavior, Warr found that the transition to marriage was followed by a dramatic decline in time spent with friends as well as exposure to delinquent peers, and that these factors largely explained the association between marital status and delinquent behavior (Warr, 1998:183).

Finally, two recent studies bear directly on the current analysis because they examine whether underlying latent traits or social influences predict offending behavior. For example,

Wright et al. (1999) tested a social causation/social selection model using data from the Dunedin Longitudinal Study and found that social causation effects remained significant even after controlling for preexisting levels of self-control, although the effects were diminished. Simons and his colleagues (1998) examined the stability of early anti-social behavior and subsequent delinquency using data from the Iowa Youth and Families project and found that social processes involving ties to school and parenting behavior were related to subsequent conduct problems in adolescence even after controlling for prior levels of antisocial behavior. In short, their results were inconsistent with a latent trait interpretation of the linkages between antisocial behavior over time.

CURRENT FOCUS

Evidence is beginning to suggest that time-varying within-individual characteristics are important for a more complete understanding of continuity and change in criminal offending. Unfortunately, two gaps remain in the literature. First, although the work of Sampson and Laub (1993) has brought to light the importance of post-adolescent events and experiences, little remains known about what specific experiences and life events are important in altering upward or downward trajectories of criminal offending (Nagin and Paternoster, 2000). Second, little remains known about how the effects of specific experiences and life events on criminal offending vary during a period of the life course when the aggregate age-crime curve evidences a sharp decline in criminal behavior.

In the present study, we move beyond and build upon prior research on continuity and change in criminal careers in a number of important ways. First, we use prospective data on male releasees from California Youth Authority (CYA) institutions to study the relationship

between life circumstances and involvement in criminal offending for a seven-year post-parole period. Amidst speculation and evidence confirming that many criminal offenders are likely to return to correctional facilities over their lives (Beck and Shipley, 1989; Petersilia, 1999), information on the post-release offending patterns for this sample appear relevant. For example, knowledge on the correlates of persistence and desistance are severely lacking in the criminological literature, and thus little remains known regarding the development of effective prevention and treatment programs that could aid in the desistance process. Information on this front could help mobilize efforts to prevent continuity in crime and perhaps accelerate the desistance process for active criminal offenders.

The prospective data we analyze is particularly desirable because it allows for an adequate examination of how changes in life circumstances influence (or fail to influence) patterns of criminal offending. Importantly, our data measure the timing and sequence of changes in life events post-parole from the CYA. Such data allow us to offer more accurate inferences about individual trajectories of stability and change (Rutter, 1988; Nagin et al., 1995).

Second, the statistical model we employ is based on the semiparametric model developed by Nagin and Land (1993) to study trajectories of criminal offending over the life course. This statistical model departs from growth curve and hierarchical analyses primarily in its treatment of individual heterogeneity. For example, hierarchical modeling captures individual variation in developmental trajectories via a random coefficients modeling strategy while latent growth curve modeling relies on covariance structure methods. These two approaches model variation in the parameters of developmental trajectories using continuous multivariate density functions. The models used in the present study employ a multinomial modeling strategy that approximates the

heterogeneity in offending trajectories with a finite number of distinctive groups that vary not only in terms of the level of offending but also the rate of offending over time (Nagin and Land, 1993; Land and Nagin, 1996; Land et al., 1996; Nagin, 1999). This approach not only captures the cumulative impact of change but also the time path by which change is achieved.

This model has a number of useful features that extend prior efforts. First, it does not require that we build the mixture from any specific probability distribution. In other words, we are free to choose any probability distribution that makes sense for our specific problem. This is not the case with hierarchical and covariance structure modeling. Second, because each individual is observed at multiple time periods, it is unlikely that offense counts at different time periods are independent of each other. Thus, we allow for this within-subject dependence. Third, in light of research showing that the incidence of criminal activity within individuals changes over the life course (LeBlanc and Loeber, 1998), it is reasonable to expect that very different parameters govern the growth of offending in different sub-populations (see Nagin and Land, 1993). Thus, the models used herein assume that these parameters are drawn from a multinomial distribution whose shape is estimated from the data. In this sense, they can be viewed as semiparametric as opposed to fully parametric.

Third, we extend the Nagin-Land model to allow for the joint distribution of violent and non-violent criminal offending over the life course (Brame et al., 2000). In the analyses that follow, we not only describe the relation between life circumstances and violent and non-violent offending separately, but we also examine the covariation of these behaviors over time as they relate to life circumstances. This particular approach is based on the notion that the most active and serious criminal offenders are also the ones believed to engage in the most varied of criminal

acts (Hirschi and Gottfredson, 1994; Farrington, 1998; Piquero, 2000). Thus, the primary advantage of this model extension is that it allows us to estimate a statistical model who parameters govern the joint longitudinal distribution of (a) violent and (b) non-violent forms of criminal activity. In other words, we will be able to examine each individual's joint trajectory on both violent and non-violent criminal offending. To the best of our knowledge, this estimation procedure cannot be accomplished with hierarchical and/or covariance structure methods.

Finally, our data take into consideration exposure time, or the amount of time individuals are incapacitated such that they are able to engage in crime while on the street. The relevance of this issue was recently demonstrated by Piquero and his colleagues (2000). Their study, using a population of serious offenders, found that controlling for exposure time reveals different conclusions about the number of offenders who are classified as persisters and desisters. For example, without controls for exposure time, 92% of their sample incurred salient declines in offending throughout the late twenties and early thirties; however, with controls for exposure time, 72% of the sample exhibited this decline while the remainder of the sample remained quite active in criminal behavior. In short, controlling for exposure time is desirable because it allows for a more accurate understanding of continuity and change in offending behavior among samples of serious offenders.

In sum, the methodological and statistical strengths of the current analysis will allow for a rigorous examination of continuity and change in offending careers among a sample of serious offenders. Additionally, the analysis will allow for a thorough examination of whether changes in informal social controls affect changes in offending behavior during 'emerging adulthood' while controlling for criminal propensity. In sum, this analysis examines directly some of the

key theoretical debates in the field of criminology.

DATA AND METHODS

We analyze the effect of local life circumstances on the joint distribution of violent and non-violent criminal offending for 524 males released from California Youth Authority (CYA) institutions.[2] These individuals were released from the CYA at various ages around the late teens-early twenties, but were followed for a seven-year post-parole period. To illustrate, consider two separate males, one released from the CYA at age 17 and the other released at age 20. The first individual is followed for seven consecutive years post-CYA release until age 24 (beginning with age 18) while the second individual is followed for a different seven consecutive years post-CYA release until age 27 (beginning with age 21).

In California, once a ward is committed to the Youth Authority, an arrest history is initiated. Any adult arrest(s) and/or subsequent incarceration(s) are reported by law enforcement to the California Department of Justice. For the small percentage of individuals who were not of adult age at the time of their release, subsequent arrests are reported to the California Department of Justice by the Youth Authority while the ward is on parole.

For each individual, we obtained information on counts of criminal arrests as well as information on exposure time. Information on criminal behavior was obtained from California

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[2]Although some readers will raise a concern with the study of an offending population, we remind them that in order to study patterns of persistence (i.e., continuity) and desistance (i.e., change), one needs to have data for a group of offenders for a consecutive period of time.

Criminal Identification and Investigation (CII) rap sheets. In this paper, we focus on the joint distribution of violent and non-violent arrests. Violent arrests included murder, rape, aggravated assault, robbery, and other person offenses such as extortion and kidnapping. Non-violent arrests included burglary, receiving stolen property, grand theft, forgery, and grand theft auto. Data on exposure times were also obtained from the CII information. Within each year time period, individuals were coded free for the number of months that they were not serving time in jail, prison, or in CYA detention; otherwise they were coded as being under some form of correctional supervision. So, an individual who was in prison for eight months during a particular year would be coded as having exposure time equal to four months.

Data on life circumstances were collected from CYA case files. Specific information was collected on (1) alcohol dependence, (2) heroin dependence, (3) full-time employment, and (4) marriage. During the course of each of the seven years of observation, each individual was given a 'month-score' as to how many months they were involved in each of the life circumstances noted above (0=not involved, 1=involved). The coding procedure for the life circumstance indicators followed a count of the number of months each individual was involved in that particular life circumstance. So, for example, an individual who was observed as married for eight months of one year would be given a score of eight on the number of months married in the past year variable. Therefore, the local life circumstances were coded in terms of change in status. Offenders were assumed to maintain the same status unless the change was noted in the CDC files.

Studying these four local life circumstances is important because each has been found to be related to persistence/desistance in criminal offending. For example, being married and/or

employed have each been found to be inhibitors of criminal behavior, while not being married and/or not being employed have been found to predict criminal offending, including the persistence of offending (Horney et al., 1995; Laub et al., 1998; Nielson, 1999; Ouimet and LeBlanc, 1996). In addition, alcohol and drug use have been found to be related to participation in criminal activity (Reiss and Roth, 1993; Anglin and Hser, 1990) while their lack of use has typically been related to a reduction and/or cessation of criminal activity (Kerner et al., 1997). Heroin use in particular, with its status as the "hardest" or most serious drug (Kaplan, 1983) is strongly linked with criminal activity. According to Nurco et al. (1993), offenders engaging in the most serious forms of drug abuse (i.e., heroin addiction) also engaged in the most serious types of crime.

In addition to studying the additive effects of these local life circumstances, we follow previous research (Sherman and Smith, 1992; DeJong, 1997) and develop an index gauging an offender's stake in conformity. This index combines the life circumstances of marriage and full-time employment. Individuals possessing neither of these circumstances were coded as (0), individuals possessing one or the other were coded as (1), and individuals possessing both were coded as (2). This particular index of informal social control is salient for the present investigation because it is consistent with Sampson and Laub's (1993:21) position that "....social ties to jobs and family...are the key inhibitors to adult crime and deviance."[3] Such an index

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[3]Sampson and Laub have argued that it may not necessarily be participation in social bonds that are salient for inhibiting criminal offending; rather the attachment or level of involvement may be more indicative of social capital. Unfortunately, our data do not contain such measures. Nevertheless, being married, being employed, etc. should imply some level of social bonding; after all, one would probably not be married if one did not have affective ties to one's spouse (Nielson, 1999). As Hindelang (1973) argued, there is likely to be some overlap

allows for a more direct examination of the impact of collective or cumulative amounts of informal social control on offending behavior.

RESULTS

Descriptive Analysis

In this section, we present the results of a descriptive analysis of the California Youth Authority data discussed in the previous section. We will begin by documenting the overall patterns of violent and non-violent criminal activity in these data. In particular, we will focus on the extent to which levels of violent and non-violent criminal activity change during the late teens and early twenties. After this survey of the incidence of violent and non-violent offending, we turn to an examination of the various covariates that we use in our more detailed analysis.

Table 1A presents a frequency distribution of the number of arrests for violent offenses at each age while Table 1B presents a similar frequency distribution of the number of arrests for non-violent offenses at each age. Two features of this table need to be highlighted. First, the number of individuals observed at each age varies. There are two reasons for this: (1) each individual was followed for a maximum of seven years and the ages at the first year of the study ranged from 16 to 22; and (2) individuals were not necessarily free in the community to commit crimes during the entire follow-up. Second, for both violent and non-violent activity, the

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between these proxies and the theoretical constructs underlying their examination (e.g., persons who are employed are more likely to be committed to their job simply because they have jobs to be committed to). In a similar fashion, Horney et al. (1995:657-658; see also Nagin and Paternoster, 1994) note that upon entry into such social institutions, one's "social investment in these institutions accumulates from that point on." In addition, researchers using 'participation' measures have found effects consistent with the social bond predictions emanating from Sampson and Laub's theory (DeJong, 1997). Thus, we believe that such measures serve as useful indicators in this line of research, especially given its infancy.

analysis reveals that offending seems to rise to a peak in the early twenties and decline thereafter.

In order to better understand the time trend in arrests for both violent and non-violent criminal activity, we estimated a Poisson regression model that parameterizes the average number of arrests for an individual at a particular age as a log-quadratic function of age and the number of months an individual is "on the street" at that age (up to twelve months in the year). Table 2 presents the "street time" distribution for the California Youth Authority sample. We write the expected number of arrests for violent crimes at age t as:

$$E(v_t) = \lambda_{v_t} = \exp\left[\alpha_{v0} + \alpha_{v1}\frac{t}{10} + \alpha_{v2}\frac{t^2}{100} + \log_e(s_t)\right]$$

where t ranges from 16 to 28 and s_t denotes the number of months an individual is not incarcerated (i.e., on the street) at year t. In similar fashion, we write the expected number of arrests for non-violent crimes as:

$$E(n_t) = \lambda_{n_t} = \exp\left[\alpha_{n0} + \alpha_{n1}\frac{t}{10} + \alpha_{n2}\frac{t^2}{100} + \log_e(s_t)\right]$$

For both of these equations the vector, α, is comprised of maximum likelihood estimates of the time trend parameters in the population from which our sample is drawn. These estimates are obtained by maximizing the likelihood function assuming a simple Poisson probability mass function assuming independent time periods both within and across individuals:

$$L(\alpha_v, \alpha_n) = \prod_{i=1}^{N}\left[\prod_{t=16}^{28}\left(\frac{\exp(-\lambda_{v_{it}})\lambda_{v_{it}}^{v_{it}}}{v_{it}!}\right)\times\left(\frac{\exp(-\lambda_{n_{it}})\lambda_{n_{it}}^{n_{it}}}{n_{it}!}\right)\right]$$

Table 3 presents the results of this analysis with standard errors adjusted for overdispersion in the violent and non-violent arrest distributions. The adjustments used here are consistent with those described by McCullagh and Nelder (1989:124-128,174-175). Figure 1 presents a graph of the

violent and non-violent arrest trends based on the parameter estimates presented in Table 3. Again, the basic theme of these results is that both violent and non-violent arrests rise to a peak during the late teens and early twenties and they fall from that point on.

Heterogeneity in Offending Trends

Although the analysis presented in the previous section is helpful for describing the basic trends in violent and non-violent arrest activity for the California Youth Authority sample as a whole, it has some important limitations. First, the overall trends in violent and non-violent arrest activity are summaries of what might be a more complex pattern of arrest activity (Nagin 1999). A model that takes the possible heterogeneity of trends in arrest activity into account would provide a more complete and accurate description. Second, the descriptive model assumes that the violent and non-violent arrest trends are independent of each other. In light of research showing that offenders tend not to specialize in particular types of offending behavior, however, this assumption seems quite unrealistic (see e.g., Blumstein et al., 1986; Nagin and Tremblay 1999; Brame et al., 2000). Third, a great deal of research on longitudinal patterns of offending behavior suggests that individuals exhibit stable differences in their proclivity to offend (see e.g., Nagin and Farrington 1992; Nagin and Land 1993; Nagin 1999). It is necessary to take these dependencies into account when estimating models that purport to describe trends in offending activity over long periods of time.

A useful method for addressing all of these issues involves the use of a more complicated version of the Poisson model described in the previous section. The key difference between this more complicated model and the descriptive model is an allowance for a finite mixture of

Poisson processes along the lines discussed by Nagin and Land (1993), Land, McCall, and Nagin (1996), and Nagin (1999). The likelihood function for this mixture model is given by:

$$L=\prod_{i=1}^{N}\left(\sum_{j=1}^{k}\pi_j\left[\prod_{t=16}^{28}\left(\frac{\exp(-\lambda_{v_{itj}})\lambda_{v_{itj}}^{v_{it}}}{v_{it}!}\right)\times\left(\frac{\exp(-\lambda_{n_{itj}})\lambda_{n_{itj}}^{n_{it}}}{n_{it}!}\right)\right]\right)$$

where the parameters now depend on the support of the mixing distribution. The mixing distribution is multinomial and can have any shape. A key issue in estimating such models is determining the optimal number of components in the mixing distribution. The most widely used method involves evaluation of the Bayesian Information Criterion (BIC) (D'Unger et al., 1998; Nagin 1999). The BIC provides researchers with a means to assess the most probable model from a set of candidate specifications. For a particular model, the BIC is given by:

$$BIC=\log_e(L)-\left[\frac{1}{2}\times\log_e(N)\times K\right]$$

where K is the number of components in the mixing distribution, N is the sample size, and log(L) is the natural logarithm of the likelihood function. In this paper, we follow the standard approach of choosing the model that maximizes BIC. Candidate specifications from one to five components were considered. We were unable to achieve convergence with a five component model. This typically means that there is not enough heterogeneity in the observed data to support a more complicated model (see e.g., Nagin and Land 1993). Out of the other models considered a four component model maximized BIC and we, therefore, focused our interpretation on that specification. Table 4 presents the parameter estimates and standard errors associated with the four component model.

Because of the number of nonlinear terms in this model, it is somewhat difficult to

interpret the numerical values of the parameter estimates. Consequently, Figure 2 presents a graph of the violent and non-violent arrest trajectories for each component of the mixture under the assumption of twelve months of street time at each age. There are two interesting features of this analysis. First, it reveals substantial heterogeneity in the long-term outcomes of this sample of California Youth Authority releasees. Therefore, at least for this sample, it would not be realistic to simply assume that all of these individuals are at high risk for future problems or that they all have similar outcomes. Instead, it is apparent that some of these releasees go on to essentially desist from further offending activity while others exhibit more persistent tendencies to offend.

Second, the analysis reveals a positive but imperfect association between variation in violent and non-violent arrest activity. In general, those who rank low on violent activity also tend to rank low on non-violent activity. This cross-behavior stability notwithstanding, there is also a group of individuals exhibiting a moderate ranking on violent activity but a relatively high ranking on non-violent activity. So, the analysis helps to illustrate how trends in one behavior can be used to help predict trends in another behavior. We nevertheless must keep in mind that such predictions will not be perfect.[4]

Effects of Covariates on Post-Parole Activity After Adjusting For Trend Heterogeneity

An important focus of our analysis involves an assessment of how variation in several

[4] The basic theme of the graphs for trajectories T_1 and T_2 is one of relatively little change. Moreover, the up-tick in offending for T_1 should not be overanalyzed since there are a small number of offenders at ages 27/28 (see Table 2).

covariates is associated with arrest activity over the course of the follow-up period. Specifically, we investigated the association between arrest activity and the following covariates: (1) race (a time-stable characteristic coded 1 = white, 0 = nonwhite)[5]; (2) stake in conformity (a time-varying variable coded 0 = neither married nor employed, 1 = either married or employed, 2 = both married and employed); (3) heroin use (a time-varying variable coded 0 = no heroin use, 1 = heroin use); and (4) alcohol use (a time-varying variable coded 0 = no alcohol use, 1 = alcohol use). Table 5 provides summary statistics for these covariates in our sample. Because it is possible that individual time-stable characteristics may be simultaneously influencing variation in these covariates (with the exception of race) and arrest activity, it is important to try to adjust for the influence of these stable individual differences. Our objective is to be able to assess whether and to what extent these covariates are associated with violent and non-violent arrest activity after conditioning on stable individual differences.

To accomplish this task, we adopt the methods described by Laub, Nagin, and Sampson (1998). Their basic approach is to use information from a trajectory model like the one estimated in the previous section to actually sort individuals into one of the four trajectory groups based on their observed offending history. This classification scheme is based on calculating the posterior probability of trajectory group membership for each individual in the sample and for each trajectory group. For each group, the calculation is given by:

$$\Pr(\text{Individual } i \text{ is in trajectory group } j \mid v_i, n_i) = (L_{ilj} \times \pi_j) / \Sigma_j(L_{ilj} \times \pi_j)$$

where L_{ilj} is the likelihood function for the trajectory model in the previous section for individual

[5] Regarding race, lack of large sample sizes among non-whites precluded more specific race analysis. For example although Whites comprised 48.5% of the sample, African-Americans

i assuming that the individual actually is a member of trajectory group *j*, π_j, is the estimated unconditional probability that individual *i* is a member of trajectory group *j*, and the outcome of the calculation is the (posterior) conditional probability that individual *i* is a member of trajectory group *j*, given the available data, v_i and n_i. For purposes of our analysis, each individual will have four of these posterior probabilities – one for each trajectory group. We then assign each individual to the trajectory group to which he has the highest estimated posterior probability of belonging. Table 6 presents the frequency distribution of this new "trajectory group" variable along with the average posterior probability of each individual's being assigned to the group that he has the highest probability of belonging. This analysis suggests that the vast majority of individuals in our analysis have a very high probability of being assigned to the group that maximizes this posterior probability.

The next step of our analysis is to estimate a Poisson regression model for each group where the dependent variables are the number of arrests for violent and non-violent activity, respectively. The independent variables in this analysis are the covariates described above. Following Laub, Nagin, and Sampson (1998), the strength of this analysis is based on the fact that we condition on group membership before estimating the effects of the covariates. This feature of the analysis provides a strong control for persistent individual differences in offending activity which could bias parameter estimates of the effects of these covariates.

Table 7 presents the results of this analysis. Scale factors are also provided since these are used to adjust the standard errors of the parameter estimates for overdispersion (McCullagh and Nelder 1989:124-128,174-175). For violence, it appears that whites have a significantly

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comprised 33%, and Hispanics and Other comprised 16.6% and 1.9%, respectively.

lower risk of arrest for trajectory groups 2 and 4 but not for the other groups. Race appears to have no effect at all on risk of arrest for any of the trajectory groups for non-violent offending. The sign of the stake in conformity effect is negative in most of the models (the models for trajectory group 3 are the exception) presented in Table 7 but is only statistically significant (two-tailed $p < .05$ level) for nonviolent arrest activity in trajectory group 2. For non-violence, heroin use appears to increase the risk of arrest for all four groups but is only statistically significant at the two-tailed $p < .05$ level in Groups 2 and 4. Finally, alcohol use is positively associated with violent arrest activity in Group 4 but its effect is not statistically significant at the two-tailed $p < .05$ level in the other analyses.

The major theme of the results presented in Table 7 is that most of the parameter estimates for the covariates being studied are not statistically significant at conventional levels. Although, in general, the signs for the stake in conformity variable are negative and the signs for the heroin and alcohol use variables are positive, the sampling distributions for most of these effects does include zero. It is, therefore, difficult to infer a great deal about the signs of these effects based on this evidence. It might be argued that reduced statistical power is responsible for the wide sampling distributions on these parameter estimates. However, it is important to keep in mind that each of these groups of individuals is observed over multiple time periods. Therefore, the likelihood function in each analysis is evaluated from a minimum of 276 times for trajectory group 3 to a maximum of 1,624 times for trajectory group 2. All of the analyses, therefore, meet the large sample requirements for obtaining desirable properties from the ML estimates.

We then conducted an exploratory analysis where we allowed for interaction terms

between the trajectory group variable and the intercept, age, and age-squared variables while imposing the constraint that the effects for race, stakes in conformity, heroin use, and alcohol use are the same across groups. The results of this exploratory analysis are presented in Table 8. Because of the increased power of this analysis, the effect of race is statistically significant at the two-tailed $p < .05$ significance level for violent arrest activity although none of the other variables are. In addition, the effects of stake in conformity and heroin use are statistically significant at the two-tailed $p < .05$ significance level for non-violent arrest activity. In light of these results, an important question is "how large are these effects?" To answer this question, we exponentiated the parameter estimates associated with each of the covariates. This is a useful calculation because it tells us the factor by which the mean of the dependent variable is expected to change for a unit change in the independent variable. As Agresti (1996:81) notes, "The mean of Y at x+1 equals the mean of Y at x multiplied by [the exponentiated parameter estimate]." Viewed in this light, the largest effect by far in this table is the effect of race on violent arrest activity. The effects of stake in conformity and heroin use on non-violent offending appear to be relatively small even though they are statistically significant.

DISCUSSION & CONCLUSION

A cursory examination of the theoretical and empirical literature in criminology reveals several contradictory predictions regarding the influence of local life circumstances on criminal activity. In an effort to bring some evidence to bear on this question, we used data on a group of 524 releasees from the California Youth Authority to examine the relationship between local life circumstances and the joint distribution of violent and non-violent criminal offending during a

newly defined developmental period of the life course, 'emerging adulthood'.

Before discussing our results, we should identify several limitations to the current effort. First, our data come from a sample of institutional releasees from California; thus, although we believe that the pattern of results obtained herein would be similar to those observed for other jurisdictions, this remains an empirical question. Second, our data contained information solely for males. Although some qualitative data exist on the offending patterns of females (Baskin and Sommers, 1998; Maher and Daly, 1996), future efforts should attempt to collect similar data for females to determine how local life circumstances influence patterns of criminal offending. Third, our outcome measures relied on official arrest records. Although official and self-report data often produce "comparable and complementary results on such important topics as prevalence, continuity, versatility and specialization in different types of offenses" (Farrington, 1998; Weis, 1986), scholars continue to debate the merits of official and self-report data (Lauritsen, 1998). It is likely the case that a more complete study would include data from both sources (e.g., Nagin et al., 1995). Fourth, our data only contained a handful of local life circumstances. Although this type of information is difficult to collect on a monthly basis for a long period of time, future efforts should make every effort to obtain different (and more) types of local life circumstances. Principal among these circumstances is a measure for peer delinquency which has been found to be an important predictor of persistence/desistance (Jang, 1999; Osgood et al., 1996; Smith and Brame, 1994; Warr, 1998).

With these limitations in mind, four key findings emerge from our analysis. First, even among this 'high-risk' sample, not all individuals will persist in criminal activity. Our results suggest that some of the releasees go on to desist from further offending activity while others

persist in offending activity. These results are 'true' effects in the sense that they are not a function of exposure time, or the opportunity for which individuals may engage in criminal offending while free on the street. In sum, this result appears to call into question the popular policy of locking up offenders for significant periods of time while at the same time forcing certain criminological explanations to perhaps revisit the claim that there are 'life-course-persistent' offenders. As these results imply, many of these serious CYA offenders appear to be on a trajectory toward desistance, at least as measured by official records.

Second, using a model that was specifically developed to analyze the joint distribution of violent and non-violent arrest activity, our analyses revealed a positive, but imperfect association between the two criminal outcomes. On the one hand, our results suggested that, for the most part, those individuals who rank low on violent criminal activity are the same individuals who rank low on non-violent criminal activity. On the other hand, there was also a group of individuals who exhibited a moderate rank on violent criminal activity but a relatively high rank on non-violent criminal activity. Although the glass appears to be more full than empty with regard to support for the generality--rather than specialization--hypothesis, there still remains a group of individuals who may, for various reasons (i.e., differential opportunities, etc.), elect to concentrate their offending activity around non-violent criminal behavior. This finding is consistent with Wolfgang and colleagues' (1972) finding that, regardless of the crime category of initial offense x, the most likely offense category for crime $x+1$ is non-violent.

Third, to the best of our knowledge, the present study was one of the first attempts at studying the effect of several covariates, both stable and time-varying, on the joint distribution of violent and non-violent criminal activity. In studying this relationship, we proceeded along two

fronts. First, we estimated the effects of covariates on arrest activity after conditioning on trajectory group membership. This allowed us to control for differential propensities to offend, which may have confounded the relationships. With respect to the race covariate, the analysis revealed that race failed to exert an affect on the risk of arrest for any of the trajectory groups for non-violent criminal offending; yet race exerted a significant effect on violent criminal activity. This result is consistent with much published research reporting higher arrest rates of violent criminal activity for blacks (see review in Blumstein et al., 1986).

With respect to stakes in conformity, our results were mixed. Although the indicator exhibited the anticipated negative effect, it was only statistically significant for two trajectory groups, group four for violent arrest activity, and group two for non-violent arrest activity. Heroin use exhibited a significant and positive effect for groups two and four for non-violent arrest activity. In an exploratory analysis, we estimated a model where we allowed for interaction terms between the trajectory group variables and the intercept, age, and age-squared variables while imposing the constraint that the effects for race, stakes in conformity, heroin use, and alcohol use were the same across groups. Interestingly, these results indicated that race was significantly related to violent arrest activity, while heroin use and stakes in conformity were significantly related to non-violent arrest activity. These results seem to be somewhat supportive of theoretical statements that advance a change perspective, though the evidence is not very strong on this front. Nevertheless, the fact that the stakes in conformity variable was significant even after controlling for persistent individual differences does support Sampson and Laub's notion that informal social controls matter.

What do the findings from the present analyses offer for the larger continuity/change

debate that encircles contemporary criminological theory? On the face of it, our results show that criminal offending appears to involve both a mixture of time-stable individual differences in criminal propensity (i.e., population heterogeneity) and the causal effect of time-stable and time-varying factors (i.e., state dependent effects). Thus, theoretical models that align themselves with only one of these positions would therefore fail to provide a complete picture of the crime-generation process. As such, theoretical accounts that provide for a combination of persistent heterogeneity and state dependent effects (or social- and self-control mechanisms) seem to be more consistent with the results of this study (e.g., Nagin and Paternoster, 1993; Piquero and Tibbetts, 1996; Sampson and Laub, 1993; Wright et al., 1999).

What does the future hold? Several promising, though difficult questions lay on the horizon for those interested in navigating this line of research. The first concerns the collection of more and different types of local life circumstances. Previous empirical tests, as well as our own, have not examined the full range of specific experiences and life events to determine how they influence (or fail to influence) the joint distribution of violent and non-violent criminal activity. Moreover, we know perilously little about how such relationships vary across race and sex groups, especially in light of evidence to suggest that such groups differentially experience and interpret life events (see Nielson, 1999 for a discussion on race and Broidy and Agnew, 1997 for a discussion on gender).

Second, and perhaps most importantly, the results provide clear evidence that for the majority of the 524 serious offenders in this study, their criminal trajectory was on a downswing as they approached their late 20's, regardless of exposure time. Although the desistance curve was much sharper and dramatic for declining rates of non-violent criminal activity (especially for

group four), the trend was in a similar direction among all four groups for the violent arrest rate. In fact, when examining the violent arrest rate, we observed that over 87% of the CYA releasees experienced a violent arrest rate less than .60 by the late 20's. The 65 (12.4%) offenders who continued to experience violent arrest rates around 2.0 per year by the late 20's therefore, although comprising a small number of individuals, highlights the importance of (a) decomposing aggregate age-crime curves into distinct offending trajectories, and (b) studying in a more in-depth fashion the determinants of violent arrest activity among this small select group.

In effect, this observation seriously challenges proponents of '3 Strikes' and/or 'life-term' policies that propose to incarcerate offenders well into adulthood, and in many cases, into late adulthood. As our results demonstrate, the criminal activity of a group of serious offenders from California is decreasing as they enter into their mid to late 20's. That we observed some of the change in non-violent criminal activity to be a function of participation in informal social bonds, especially after controlling for individual propensity, highlights the importance of strengthening offenders' ties to social control agents, especially those that are independent from the formal legal system. As several scholars argue (Horney et al., 1995; Laub et al., 1998), investment in social bonds appears to provide some sort of 'looking-to-the-future' view, a future that need not be riddled with criminal activity. This is especially the case as individuals transition from emerging adulthood to young adulthood in the late twenties that instability ceases and more enduring choices in love and work are made (Arnett, 2000:471). This assertion is consistent with the analysis in the current study.

For example, at age 18, the value of the stakes in conformity indicator was .268, but at age 26 it was equal to .644, an increase of 58%. This suggests that even among a population of

serious offenders, investment in social bonds is possible, and that such an investment serves an inhibitory effect on non-violent criminal activity, *independent of persistent individual differences*. Thus, many serious offenders can, in the parlance of Moffitt et al. (1996), 'recover' from their criminal trajectories and desist from crime as they enter adulthood. Early identification of these factors remains a high priority for researchers and policy makers.

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Table 1A
Violent Arrest Frequency Distributions (N = 524)

Age	Number of Arrests						Number of Individuals	Average Arrest Frequency
	0	1	2	3	4	5+		
16	1	0	0	0	0	0	1	0.00
17	36	2	0	0	0	0	38	0.05
18	157	34	7	5	2	0	205	0.35
19	267	56	20	13	0	0	356	0.38
20	313	73	23	7	1	1	418	0.36
21	332	69	18	11	5	1	436	0.38
22	342	58	17	8	5	3	433	0.36
23	300	63	27	6	0	4	400	0.40
24	312	37	23	8	1	1	382	0.30
25	185	22	5	3	2	1	218	0.25
26	70	10	3	3	0	1	87	0.36
27	23	2	1	0	0	0	26	0.15
28	3	2	0	0	0	0	5	0.40

Table 1B
Non-Violent Arrest Frequency Distributions (N = 524)

Age	Number of Arrests						Number of Individuals	Average Arrest Frequency
	0	1	2	3	4	5+		
16	0	1	0	0	0	0	1	1.00
17	18	14	4	0	2	0	38	0.79
18	61	59	27	17	15	26	205	1.94
19	87	69	69	39	23	69	356	2.51
20	115	85	60	44	39	75	418	2.53
21	133	80	78	42	30	73	436	2.31
22	131	95	55	49	32	71	433	2.36
23	132	93	50	39	30	56	400	2.18
24	132	81	65	28	28	48	382	1.99
25	89	43	29	23	9	25	218	1.71
26	34	19	16	9	4	5	87	1.51
27	10	8	4	1	1	2	26	1.73
28	2	2	0	1	0	0	5	1.00

Table 2
Street Time Distribution (In Months) By Age

Age	Number of Individuals	Average Number of Months on Street
16	1	7.00
17	38	8.71
18	205	8.40
19	356	9.03
20	418	8.81
21	436	8.88
22	433	8.88
23	400	9.08
24	382	9.17
25	218	9.21
26	87	9.14
27	26	8.96
28	5	10.60

Table 3
Parameter Estimates For Log-Quadratic Poisson Trend Model

Parameter	Estimate	Std. Error	|z|-ratio
Violent Arrests			
α_0	-11.042	5.001	2.21
$\dot{\alpha}_1$	7.506	4.634	1.62
α_2	-1.786	1.066	1.68
Scale Factor	1.787		
Non-Violent Arrests			
α_0	-9.953	2.506	3.97
α_1	8.354	2.326	3.59
α_2	-2.015	0.536	3.76
Scale Factor	2.223		

Note: Standard errors and *z*-ratios are adjusted for overdispersion using methods described in McCullagh and Nelder (1989).

Table 4
Parameter Estimates For Log-Quadratic Poisson Mixture Model (N=524)

Parameter		Violent Arrests			Non-Violent Arrests		
		Estimate	Std. Error	|z|-ratio	Estimate	Std. Error	|z|-ratio
Group #1	α_0	7.540	12.198	0.62	-3.220	7.370	0.44
	α_1	-11.704	11.146	1.05	.445	6.740	0.07
	α_2	2.798	2.530	1.11	-.144	1.531	0.09
Group #2	α_0	-12.457	5.811	2.14	-5.134	2.311	2.22
	α_1	9.054	5.492	1.65	3.515	2.175	1.62
	α_2	-2.247	1.291	1.74	-.865	.505	1.71
Group #3	α_0	-8.044	6.247	1.29	-10.556	4.943	2.14
	α_1	5.331	5.833	0.91	9.618	4.731	2.03
	α_2	-1.098	1.355	0.81	-2.406	1.124	2.14
Group #4	α_0	-30.630	9.243	3.31	-18.354	2.357	7.79
	α_1	24.885	8.525	2.92	16.709	2.189	7.63
	α_2	-5.622	1.956	2.87	-3.892	.507	7.67

π_1 = p(Group #1) = .145
π_2 = p(Group #2) = .511
π_3 = p(Group #3) = .124
π_4 = p(Group #4) = .220

Table 5
Distributions of Covariates At Each Age

Age	Number of Observations	Race = White	Stake in Conformity	Heroin Use	Alcohol Use
16	1	1.000	.000	1.000	.000
17	38	.500	.105	.263	.132
18	205	.468	.268	.239	.161
19	356	.447	.284	.292	.191
20	418	.483	.349	.337	.220
21	436	.486	.440	.388	.239
22	433	.480	.460	.413	.266
23	400	.505	.523	.418	.275
24	382	.516	.558	.393	.288
25	218	.550	.601	.413	.307
26	87	.609	.644	.414	.356
27	26	.731	.500	.500	.231
28	5	.600	.400	.200	.400

Table 6
Trajectory Group Classification Distribution and Posterior Group Assignment Probabilities

Trajectory Group	Number of Individuals	Percent of Total	Mean Posterior Probability
T_1	73	13.9	0.905
T_2	277	52.9	0.899
T_3	64	12.2	0.852
T_4	110	21.0	0.924
Total	524	100.0	

Table 7
Estimated Effects of Covariates on Arrest Activity After Conditioning on Group Membership

Parameter	Violent Arrest Activity							
	Group 1 (N =73)		Group 2 (N =277)		Group 3 (N =64)		Group 4 (N =110)	
	Estimate	|z|-ratio	Estimate	|z|-ratio	Estimate	|z|-ratio	Estimate	|z|-ratio
Intercept	13.773	1.00	-13.056	2.03	-5.930	0.75	-32.918	3.08
Age/10	-17.170	1.36	9.746	1.63	3.541	0.49	26.989	2.75
Age²/100	3.971	1.39	-2.369	1.71	-.697	0.42	-6.096	2.72
Race = White	-.389	1.05	-.582	4.19	-.210	0.85	-.440	2.15
Stake in Conformity	-.069	0.25	-.032	0.29	.060	0.31	-.331	1.69
Heroin Use	.509	1.08	-.148	1.07	-.080	0.38	.267	1.29
Alcohol Use	.797	1.81	-.037	0.24	-.117	0.55	.478	2.33
Scale Factor	1.277		1.398		1.885		1.291	
	Non-Violent Arrest Activity							
Intercept	-7.455	0.94	-4.640	1.67	-7.636	1.39	-18.036	4.51
Age/10	4.003	0.55	3.028	1.17	6.843	1.33	16.383	4.42
Age²/100	-.882	0.54	-.758	1.28	-1.772	1.47	-3.816	4.48
Race = White	.011	0.06	.022	0.36	-.019	0.13	-.026	0.30
Stake in Conformity	-.214	1.53	-.109	2.05	.075	0.61	-.104	1.35
Heroin Use	.396	1.58	.140	2.19	.212	1.62	.196	2.27
Alcohol Use	-.029	0.10	.132	1.89	-.010	0.08	-.004	0.04
Scale Factor	1.401		1.688		1.600		2.203	

Table 8
Estimated Effects of Covariates on Arrest Activity After Conditioning on
Group Membership and Imposing Equality Constraints On Covariates Across Groups

Parameter	Violent Arrests			Non-Violent Arrests		
	Estimate	|z|-ratio	exp(Estimate)	Estimate	|z|-ratio	exp(Estimate)
Intercept	-34.624	2.96		-18.023	5.65	
Group 1	47.300	2.50		11.293	1.08	
Group 2	21.725	1.63		13.565	3.16	
Group 3	28.582	2.18		10.317	1.51	
Group 4	.000			.000		
Age/10*Group 1	-16.146	1.18		3.324	0.36	
Age/10*Group 2	9.563	1.58		2.856	1.06	
Age/10*Group 3	3.635	0.66		6.881	1.21	
Age/10*Group 4	28.821	2.68		16.350	5.54	
$Age^2/100$*Group 1	3.780	1.22		-.731	0.36	
$Age^2/100$*Group 2	-2.343	1.67		-.716	1.16	
$Age^2/100$*Group 3	-.720	0.58		-1.766	1.34	
$Age^2/100$*Group 4	-6.533	2.66		-3.809	5.61	
Race = White	-.459	4.69	0.632	.001	0.02	1.001
Stake in Conformity	-.045	0.58	0.956	-.094	2.47	0.910
Heroin Use	-.006	0.07	0.994	.177	3.93	1.194
Alcohol Use	.063	0.65	1.065	.055	1.12	1.057
Scale Factor	1.423			1.765		

Figure 1
Comparison of Actual and Expected Arrest Rates For Violent and Non-Violent Offenses

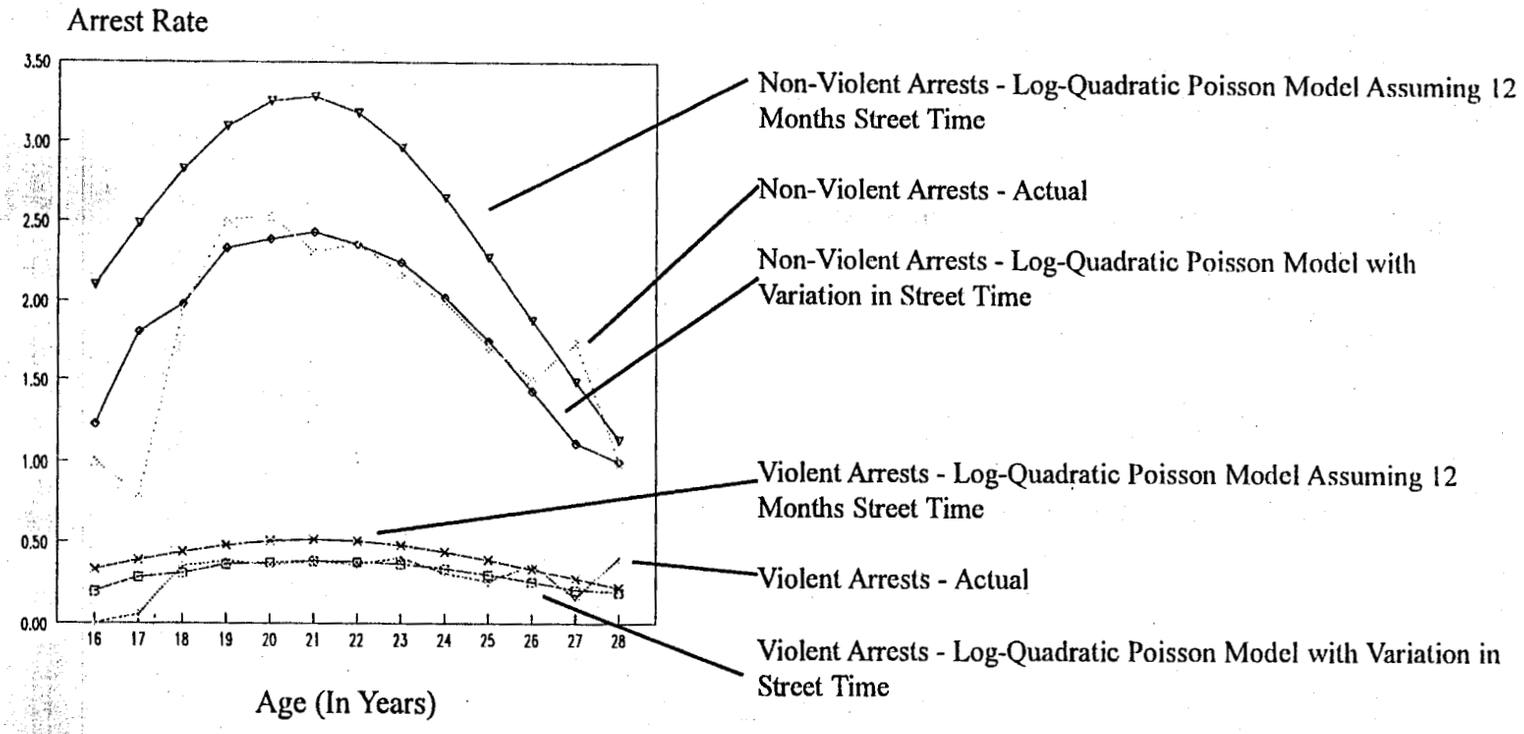

Figure 2
Summary of Violent and Non-Violent Arrest Trajectories Under Assumption of 12 Months Street Time Each Year