The Socioeconomic Determinants of Ill-Gotten Gains: Within-Person Changes in Drug Use and Illegal Earnings[1]

Christopher Uggen
University of Minnesota

Melissa Thompson
Portland State University

Generalizing from the sociology of earnings attainment, we develop a conceptual model of social embeddedness in conventional and criminal activities to explain illegal earnings among criminal offenders. To isolate the effects of time-varying factors such as legal earnings, drug use, and criminal opportunities, we use data from the National Supported Work Demonstration Project to estimate fixed-effects models predicting month-to-month changes in illegal earnings. We find that criminal earnings are sensitive to embeddedness in conforming work and family relationships, criminal experience, and the perceived risks and rewards of crime. Moreover, heroin and cocaine use creates a strong earnings imperative that is difficult to satisfy in the low-wage labor market, and offenders earn far more money illegally when they are using these drugs than during periods of abstinence.

Most crime is economic behavior. In fact, almost 90% of the serious offenses reported in the United States each year concern remunerative crimes (U.S. DOJ 2001, p. 278). Recent stratification research has also linked crime with inequality and earnings (Grogger 1998; Hagan 1991;

Pager 2003; Western 2000; Western and Beckett 1999; Western and Pettit 2002), establishing the penal system as an important labor market institution. Yet, until very recently, the study of *illegal* earnings had received scant attention (Fagan 1997; Grogger 1998; Matsueda et al. 1992; McCarthy 2002; McCarthy and Hagan 2001; Levitt and Venkatesh 2001; Tremblay and Morselli 2000). The sociology of criminal attainment and its relation to lawful economic activity thus remains "under-theorized and under-studied" (McCarthy and Hagan 2001, p. 1054).

Theories of criminal earnings must address both the paradoxical nature of deviant status attainment and extreme volatility in rates of criminal participation and remuneration. High illegal earnings may index both success, in outstripping other offenders, and failure, as some no doubt "turn to crime" when frustrated in lawful pursuits. Illegal earnings fluctuate dramatically over time, for offenders often keep one foot in street life and the other in the straight or conventional world (Hagan and McCarthy 1997). We therefore build on models of short-term changes in criminal activity (Horney, Osgood, and Marshall 1995; Osgood et al. 1996) and within-person change in legal earnings (Waldfogel 1997) to examine how criminals increase or decrease their illegal earnings as their opportunities, orientations, and social relationships change.

Changes in more proximal "foreground" priorities, such as those brought on by drug addiction or hunger, also provoke changes in illegal earnings (Hagan and McCarthy 1997). For example, there is solid empirical evidence that chronic use of heroin and cocaine is positively associated with property crime (Anglin and Speckart 1988; Fagan 1994; Goode 1997; Needle and Mills 1994; Nurco et al. 1988). Because of selectivity problems, data limitations, and the absence of well-developed theories, however, we know very little about the causal ordering of these phenomena as they unfold over time. Drug use is so intimately connected to other criminal activities that most standard statistical techniques are incapable of establishing their causal ordering (Akers 1992; Faupel and Klockars 1987; Goode 1997; White, Pandina, and LaGrange 1987). Similarly, since people self-select into legal as well as illegal work, it is difficult to determine whether lawful employment and legal earnings are causes or correlates of crime.

In this article, we develop a basic conceptual model of illegal-earnings determination and test it by analyzing month-to-month changes in criminal gains. Our discussion is organized in four parts. We first present a model of criminal earnings based on the sociology of attainment and criminological research on within-person change in crime and drug use. The second part addresses data and estimation, describing the unique illegal-earnings data of the National Supported Work Demonstration Project of the 1970s. The third part shows results of our full conceptual model

and more focused confirmatory analyses of drug use as an "illegal-earnings imperative." Finally, we discuss the generality of the earnings determination process and recent social transformations affecting drug use and crime, situating our findings in current scientific and policy debates.

CONCEPTUAL MODELS OF LEGAL AND ILLEGAL EARNINGS

In his ethnography of East Harlem crack dealers, Philippe Bourgois observes drug dealers and street criminals "scrambling to obtain their piece of the pie" following "the classical Yankee model for upward mobility" (1995, p. 326). Despite their decidedly unconventional means of obtaining money, many criminal offenders retain conventional American values of success striving and material attainment (Bourgois 1995; Matsueda et al. 1992; Venkatesh and Levitt 2000), often "moonlighting" in a variety of legal and illegal income-producing activities (Duneier 1999; Levitt and Venkatesh 2001; MacCoun and Reuter 1992; Tremblay and Morselli 2000; U.S. DOJ 2000b; Wilson and Abrahamse 1992).

In view of the connection between legal and illegal economic behavior, several lines of attainment research have been productively extended to crime, including theories of human capital (Becker 1968), social capital and embeddedness (Hagan 1993; Sampson and Laub 1993), opportunity structure (Cloward and Ohlin 1960), and rational choice (Piliavin et al. 1986). More recent investigations have scrutinized the economic lives of criminal offenders, offering models that test the generality of the earnings determination process (Levitt and Venkatesh 2000, 2001; McCarthy and Hagan 2001). We build on this work in posing a model of illegal earnings based on embeddedness in conventional and criminal activities and networks, the structure of opportunities for legal and illegal behavior, and subjective appraisals of the risks and rewards associated with crime and conformity.

Human Capital and Criminal Experience

Much of the sociological earnings literature adapts or refines human-capital theory (Becker 1962), which posits that workers are rewarded in the labor market for their investments in skills, experience, and training. Differences in remuneration thus reflect differences in individual productive capacity, as measured by education and experience. Criminal offenders gain analogous skills and experience, receiving informal tutelage that may yield returns in the form of illicit earnings (Hagan and McCarthy 1997; Sutherland 1937). For example, ethnographies by Padilla (1992) in Chicago and Sullivan (1989) in New York show how the social skills of

street-level drug dealing are learned through face-to-face interaction. Dealing is a job that must be learned gradually, requiring "a considerable investment of time to acquire skills, plan, and operate systematically" (Padilla 1992, p. 151). Other studies identify intelligence, experience, and willingness to employ limited (but not wanton) violence as predictive of illegal economic success (VanNostrand and Tewksbury 1997; Venkatesh and Levitt 2000). Illegal attainment is thus at least partly a function of criminal experience or "criminal capital" (Grogger 1998; Hagan and McCarthy 1997; Matsueda and Heimer 1997).

Conventional and Criminal Embeddedness

Sociological attainment models emphasize social relationships as well as human capital, identifying social capital (Coleman 1990) and embeddedness in interpersonal networks as fundamental to the process of getting a job and advancing in a career (Granovetter 1973, 1985; Montgomery 1992, 1994). The structured relations between persons are thought to increase or decrease earnings by constraining choices, altering perceptions, and providing networks of clients or associates for economic exchange. Even in areas with high crime rates, those who establish early personal connections to employers benefit relative to those who are less embedded in conventional job networks (Newman 1999; Sullivan 1989).

"Criminal embeddedness" in illicit roles and activities, such as street networks facilitating crime, drives illegal earnings in a similar manner (Hagan 1993). Criminal experience may gradually cumulate through embeddedness in informal "tutelage relationships" (Hagan and McCarthy 1997) or toil as a "foot soldier" in an organized gang (Levitt and Venkatesh 2000). Embeddedness is thus an emergent rather than a stable property, evolving as relations with deviant and conforming others develop over time. In street gangs in particular, peer culture and dense network ties embed members in street life while restricting access to conventional activities (Padilla 1992). Attesting to the impact of criminal embeddedness in such settings, those with ties to other successful offenders (Tremblay and Morselli 2000), those in collaborative relationships (McCarthy and Hagan 2001), and those holding leadership positions in an ongoing illegal enterprise (Levitt and Venkatesh 2000) report high illegal earnings relative to other offenders.

The Structure of Opportunity

In addition to individual differences and social networks, of course, structural opportunities shape legitimate financial rewards (Wacquant 2002). At the individual level, status origins affect socioeconomic mobility (Bib-

larz and Raftery 1999; Hout 1984; Rytina 2000); at the organization and industry level, firm size (Kalleberg and Van Buren 1996) and sector (Beck, Horan, and Tolbert 1978; Sakamoto and Chen 1991) are influential; and, at the macro level, unemployment and cohort size affect earnings attainment (Raffalovich, Leicht, and Wallace 1992).

In linking the structure of opportunities to illegal attainment, criminologists often envision people as facing "two opportunity structures—one legitimate, the other illegitimate" (Cloward and Ohlin 1960, p. 152). At the individual level, incarceration and correctional supervision constrain criminal opportunities by incapacitating offenders. At the neighborhood level, the social organization of licit and illicit opportunities (such as the availability of professional fences and organized markets to liquidate stolen goods) determines the mix of crimes committed (Cloward and Ohlin 1960; Duneier 1999, p. 218; Steffensmeier 1986). The involvement of street gangs in drug economies, for example, is situated within other forms of community social organization (Sullivan 1989; Venkatesh 1997). At the macro level, unemployment rates and enforcement patterns structure illegal opportunities, affecting crime rates and the relative attractiveness of legal and illegal work. Of course, when confronted with the same set of criminal opportunities and risks, one person may define the situation as appropriate for crime while another may not (Sutherland 1947). Measured perceptions of criminal opportunities therefore gauge both the structure of illegal opportunities and the orientations of individual actors. Moreover, both subjective perceptions and structural opportunities are time-varying, fluctuating with age, economic conditions, and other changing circumstances (Shover 1996).

Subjective Aspirations, Expectations, and Perceptions

As the preceding discussion of agency suggests, subjective perceptions and individual choices also influence earnings. Marini and Fan (1997), for example, have shown how differences in work and family aspirations explain a sizable portion of the gender gap in earnings. Other studies indicate that worker attitudes affect remuneration, net of human capital and work performance (e.g., Nollen and Gaertner 1991). With regard to crime, subjective perceptions have been most systematically examined in deterrence or choice research, illustrating how the perceived likelihood of sanction alters the probability or amount of illegal behavior (e.g., Piliavin et al. 1986). In this research and recent studies linking criminal gains to risk preferences (McCarthy 2002; McCarthy and Hagan 2001), higher illegal earnings are generally observed among those associating lower risks with crime and lower rewards with lawful work.

Drug Consumption

As drug consumption has emerged as a prominent concern in both scholarly and public discourse (e.g., Beckett 1997; Desimone 2001), social scientists have developed some basic empirical generalizations about drug use and legal earnings. For example, some forms of drug use appear to increase early career wages (Gill and Michaels 1992; Kaestner 1991), but have inconsistent (Kaestner 1994) or negative (Kandel, Chen, and Gill 1995) long-term effects. Kandel et al. (1995) suggest that young recreational drug users are likely to take jobs offering high starting wages but little potential for wage growth. It is difficult to determine from existing research whether this pattern is due to selectivity—persons with high risk preferences self-selecting into both drug use and potentially dangerous but remunerative jobs—or greater income needs tied to drug use.

Drug consumption is likely to have a different social meaning for addicts who organize their lives around the activity than it does for recreational users who consume drugs as they would other commodities (Johnson et al. 1985; Lindesmith 1938). Studies of "hard-core" cocaine and heroin users generally report strong drug effects on illegal earnings (Office of National Drug Control Policy [ONDCP] 2001), with a significant portion of drug use supported by criminal activity (Inciardi and Pottieger 1994; Jacobs 1999; Kowalski and Faupel 1990). For example, Fagan (1994) finds that female crack cocaine users report far more income-generating crime than nonusers. Similarly, Johnson and colleagues (1985, p. 159) identify a powerful "direct contribution" of current heroin use to criminal income. If, as we suggest, cocaine and heroin use creates an earnings imperative that directly impels remunerative crime, illegal earnings are likely to peak during periods of active use.

In sum, our conceptual model of illegal-earnings attainment is generalized from sociological theories of lawful attainment and criminological research on substance use and crime. We expect that experience, embeddedness in criminal and conventional networks, opportunity structure, and subjective perceptions of risk and reward will explain illegal earnings just as these factors drive legitimate attainment. By applying theories of attainment to crime, we test the generality of the earnings determination process while assessing the relative importance of the earnings imperative created by illegal drug use.

WITHIN-PERSON CHANGES IN DRUG USE AND CRIMINAL OFFENDING

Because reliable illegal-earnings data are so difficult to obtain, even the most rigorous recent investigations have been based on cross-sectional

data (Fagan 1992), retrospective inmate reports (Tremblay and Morselli 2000), or relatively small or selective samples (Levitt and Venkatesh 2000, 2001; MacCoun and Reuter 1992; McCarthy and Hagan 2001). These and other recent studies have noted the positive effects of perceived physical strength (Levitt and Venkatesh 2001), aspirations for wealth (McCarthy and Hagan 2001), and legal income (Tremblay and Morselli 2000) on criminal earnings. In perhaps the most comprehensive analysis to date, Matsueda et al. (1992) identify age, gender, drug use, criminal history, and the prestige accorded deviant work as predictors of illegal earnings.

Although such studies clearly identify the correlates of illegal earnings, they remain less than definitive in specifying causal relationships. Pre-existing differences in unmeasured factors (such as ambition or impulsiveness) may affect levels of both illegal earnings and independent variables such as drug use and legal income, biasing estimates of their effects in standard regression models. By contrast, investigators studying legal earnings (England et al. 1988; Waldfogel 1997) use fixed effects or first difference panel models to adjust estimates for these sources of unobserved heterogeneity. Although similar techniques have been applied to participation in criminal offending (Horney, Osgood, and Marshall 1995) and the frequency of criminal and deviant acts (Bushway, Brame, and Paternoster 1999; Osgood et al. 1996), no investigation to date has examined within-person changes in illegal earnings.

This omission in the illegal-earnings literature forestalls understanding of important scientific and policy questions. First, in the absence of within-person analysis, it is difficult to tell whether factors such as drug use are causes or spurious correlates of criminal returns (Hanlon, Kinlock, and Nurco 1991; Goode 1997). As Ronald Akers (1992, p. 69) succinctly summarizes the problem, "The research is characterized by disagreement over what causes what and lack of data to answer the question adequately. A specifically drug-produced motivation to commit crime *that was not present prior to using drugs* has not been established. . . . Drugs/alcohol and crime/delinquency are highly related but cannot be said to cause one another" (emphasis added). Do offenders steal to support their habits or do crime and drug use both result from an underlying propensity for deviance (Gottfredson and Hirschi 1990)? In the former case, a socioeconomic mechanism connects drugs and crime in a causal chain. In the latter case, drug use is epiphenomenal, a surface manifestation of criminal propensity, and the association between drugs and crime is spurious because of this common or correlated cause.

Second, the interrelation of legal and illegal earnings remains unexplored. Do criminals decrease their illegal activities when legal income rises? If so, financial assistance (Berk, Lenihan, and Rossi 1980) or employment programs (Uggen 2000) that provide legitimate income to of-

fenders play an important role in reducing crime. If not, such programs must be justified on grounds other than crime reduction. Finally, the problem of illegal earnings tests the scope conditions of theories of conforming and deviant behavior. Deviant careers are less structured than conventional careers, with uncertain rewards, little specialization, and an overarching need for secrecy (Luckenbill and Best 1981). Nevertheless, unified theories of socioeconomic attainment may be viable if, as some suggest, theories of legal prosperity also explain illegal success (McCarthy 2002; McCarthy and Hagan 2001).

DATA AND METHODS

The Supported Work Data File

The National Supported Work data to be analyzed provide perhaps the best available information on legal and illegal earnings among "ex-addict," "ex-offender," and "youth dropout" populations (Hollister, Kemper, and Maynard 1984). Overall, 2,268 offenders (primarily referred by parole agencies), 1,394 addicts (primarily referred by drug-treatment agencies), and 1,241 youth dropouts (referred from social service and educational institutions) participated in the study. We pooled these groups after finding few subgroup differences in the levels of independent variables or their effects on illegal earnings. The experimental program offered subsidized jobs for up to 18 months to half the sample and assigned the remainder to a control group (Hollister et al. 1984, pp. 12–90). The program operated in nine cities: Atlanta, Chicago, Hartford, Jersey City, Newark, New York, Oakland, Philadelphia, and San Francisco. Members of each group provided monthly drug use, income, and crime information at 9-month intervals for up to three years. All respondents were tracked for at least 18 months, with subgroups followed for 27–36 months. Response rates vary from 77% at 9 months to 67% at 36 months, though selectivity analyses suggest that panel attrition is unlikely to threaten inferences (Brown 1979). We estimate models using the person-month as the unit of analysis, so that cases are analyzed for all months in which valid data are available. For more detailed descriptions of Supported Work, see Hollister et al. (1984), Matsueda et al. (1992, pp. 756–59), Piliavin et al. (1986, pp. 104–7), and Uggen (2000, pp. 532–53).

Unlike many job programs, Supported Work successfully recruited socially marginalized individuals—hard-core drug users and repeat criminal offenders. Unlike studies of criminal earnings (Tremblay and Morselli 2000; Wilson and Abrahamse 1992) or offending (Horney et al. 1995) that rely on prisoners' retrospective reports, Supported Work tracked respondents in their communities. These data are thus unusually well suited to

investigate how drug use and embeddedness in criminal and conventional activities affect illegal earnings. Supported Work operated between April 1975 and December 1978, yet it remains a rare and potentially important source of information on illegal earnings. Older data sets can be a fount of both new tests of theory and important empirical generalizations, as Sampson and Laub (1993) convincingly demonstrate in their reanalysis of the Gluecks' (1950) data. Yet there are important differences between the underground economy of the 1970s and that of today, such as the rise and fall of crack cocaine markets, mass incarceration, and welfare reform. We will return to these issues and their implications in the discussion below.

Measures and Expectations

Unlike previous studies of illegal earnings (Levitt and Venkatesh 2001; Matsueda et al. 1992; McCarthy and Hagan 2001; Tremblay and Morselli 2000), our models do not include fixed regressors such as race or sex, since all stable characteristics are statistically controlled by the within-person analytic approach. The *time-varying independent variables* include self-reported cocaine and heroin use, monthly legal earnings, and monthly unearned legal income (e.g., Social Security and welfare). We lag these factors by one month to establish temporal order, but we also vary the lag structure to allow the duration of drug use to affect the level of illegal earnings. Based on prior research and our conceptual model, we expect drug use to create an earnings imperative that directly impels economic crime (Fagan 1994; Johnson et al. 1985). Conversely, greater legal earnings and other income should reduce criminal earnings (Bourgois 1995; Levitt and Venkatesh 2001; McCarthy and Hagan 2001; Sullivan 1989; but see Tremblay and Morselli 2000).

Opportunity structure measures include a dichotomous incarceration indicator, the site-specific unemployment rate, and the perceived frequency of opportunities to earn money illegally. We expect incarceration to dramatically decrease illegal earnings in the short run. While imprisonment may increase long-term illegal earnings, as Levitt and Venkatesh (2001) report among gang members, we expect a contemporaneous incapacitation effect: being locked up will decrease (but not eliminate) opportunities for economic crime. Similarly, we expect that greater perceived illegal opportunities should also increase illegal earnings. Finally, high local unemployment rates should constrain legal opportunities and increase illegal earnings, especially among convicted felons, who are generally at the rear of the labor queue (Holzer, Raphael, and Stoll 2001; Pager 2003; Western and Beckett 1999).

Criminal experience and embeddedness are indicated by arrests, age,

and friendship patterns. Although the number of arrests is an imperfect proxy for criminal embeddedness, it represents an important dimension of criminal experience (if not expertise or skill). As in models of legal earnings, we include squared terms for age and experience because we expect curvilinear relationships, or diminishing returns to criminal experience. Criminal embeddedness is also indicated by the presence of a close friend in a "full-time hustle," who is both unemployed and involved in crime. Such relationships increase illegal earnings through specialized skills, knowledge, and contacts (McCarthy and Hagan 2001; Tremblay and Morselli 2000; Warr 1998).

Human capital and conventional embeddedness are assessed by school attendance, program employment, regular employment, and cohabitation with a spouse or partner. We expect each of these characteristics to reduce illegal earnings even after statistically controlling for legal income. Work and school provide human capital, informal social controls, and a setting for conforming routine activities (Osgood et al. 1996). Although not all spouses are law-abiding (Giordano, Cernkovich, and Rudolph 2002), family relationships signal embeddedness in a network of social relations and should decrease illegal earnings (Hirschi 1969; Sampson and Laub 1990).

Subjective risks and rewards include respondents' perceived risk of being imprisoned if arrested and their expected earnings on the best job they could obtain at their present skill level. We assume that individuals have consistent preferences to act in their own interest, such that greater perceived risks should deter illegal activity. We expect legal-earnings potential to be inversely related to illegal earnings, as the availability of remunerative legal work offers a viable alternative or substitute for economic crime.

The Validity and Reliability of Self-Reported Drug Use and Illegal-Earnings Data

The primary dependent variable in this analysis is self-reported monthly illegal earnings. Because inflation eroded purchasing power over the observation period, all earnings data are adjusted for inflation and transformed into constant 1998 dollars (U.S. Department of Labor 1998; see also U.S. Department of Labor 1997). The merits of the self-report method for crime and delinquency data have been the subject of much debate and research (e.g., Hindelang, Hirschi, and Weis 1981; Piquero, MacIntosh, and Hickman 2002). The Supported Work project conducted a careful reverse record check, comparing official records of participants with self-reported arrest data. Consistent with other investigations (Elliott and Ageton 1980; Huizinga and Elliott 1986), race was the only variable related to discrepancies between self-reports and police records: African-

Americans were likely to underreport relative to whites and Latinos (Schore, Maynard, and Piliavin 1979). Because we examine within-person changes in illegal earnings, however, such group differences are unlikely to bias our estimates.

In fact, since our analytic approach statistically controls for stable individual differences, we are less concerned with systematic biases across persons ("consistent falsifiers") than with systematic biases within persons over time ("simultaneous confessors"). That is, if people were dishonest about their offending early in the study but later began to trust the interviewers and confess drug use and crime simultaneously, estimated drug effects on crime would be inflated. Fortunately, the hazard rate of the time until both drug use and illegal activities are reported is monotonically *declining* in these data (Uggen and Thompson 1999), and we find no evidence of such biases.

Our dichotomous drug-use measures come from self-reports of cocaine or heroin use. How reliable are the drug-use data? Since no official records exist for drug use and participants were not tested during the program, a reverse record check is impossible. Nevertheless, comparisons of self-reports for identical periods across Supported Work interviews revealed "no evidence that reported use during any nine-month period was differentially reported" in the ex-addict group (Dickinson and Maynard 1981, p. 19). Studies comparing self-reports with urinalyses data report rates of congruence between 74% and 86% (Anglin, Hser, and Chou 1993, p. 104) and, in some cases, over 90% (Taylor and Bennett 1999, p. 28). These studies and our within-person analytic approach should provide some degree of confidence in the validity and reliability of estimates obtained from Supported Work drug-use and illegal-earnings data.

Descriptive Statistics

Summary statistics and variable descriptions for fixed and changing characteristics of the Supported Work sample are shown in tables 1 and 2, respectively. Most participants were male (89%), African-American (76%), and had little education (10.2 years on average). Only 13% were married when they entered the program, and few had children. Table 2 shows the time-varying characteristics taken from our pooled sample of person-months. Respondents averaged approximately $333 in illegal earnings per month, although there was great variation around this mean. In any given month, about 8% of the sample reported using heroin or cocaine. Monthly legal earnings were relatively low ($670 per month), and they were supplemented on average by about $200 per month in unearned income. Only about 5% of the sample was attending school during the study period. Similarly, a minority of respondents reported work in any given month,

TABLE 1
FIXED CHARACTERISTICS

Variable	Baseline Value (t_1)
Male	89.3
African-American	76.1
White	10.8
Hispanic or other	13.1
Experimental sample ...	48.5
Youth sample	25.3
Addict sample	28.6
Offender sample	46.2
Years of education	10.2
	(1.7)
Married	13.3
N children	.18
	(.71)

NOTE.—N of cases = 4,927. Numbers in parentheses are SDs. All baseline values are percentages except for *years* of education and *number* of children.

with about 14% being employed by the project and 26% in regular non-program work. Although Supported Work data are not drawn from a national probability sample, the mean age, sex, and criminal history levels of participants are roughly comparable to those observed in official correctional populations (U.S. DOJ 2001).

ESTIMATION: POOLED CROSS-SECTIONAL TIME-SERIES ANALYSIS

Unobserved Heterogeneity

One major problem with standard (across-person) analyses is that they fail to address unmeasured factors that may be driving both independent variables such as drug use and dependent variables such as crime. While we can attempt to name, measure, and "control for" some characteristics, myriad other factors may escape our view (Sobel 1996). Therefore, we adopt a model that nets out *all* stable individual differences to ensure that unmeasured characteristics such as genetic endowment or underlying criminal propensities (Gottfredson and Hirschi 1990) will not bias our results. We estimate fixed-effects models of the form:

TABLE 2
TIME-VARYING CHARACTERISTICS

Variable	Description	Coding	Pooled Value (t_{1-36})
Drugs and money:			
Earned illegal income	Total monthly dollar amount	1998 U.S.$	333*
			(1,860)
Drug use (%)	Monthly indicator for cocaine or heroin use	0 = no,	7.7[†]
		1 = yes	
Earned legal income	Total monthly dollar amount	1998 U.S.$	670
			(1,027)
Unearned legal income	Total monthly unearned income (Social Security, welfare, unemployment, etc.)	1998 U.S.$	199
			(342)
Opportunity structure:			
Incarceration (%)	Indicator for jail and/or prison time	0 = no,	11.8
		1 = yes	
Unemployment	% unemployed in each site, measured at three-month intervals	%	7.72
			(2.55)
Illegal opportunities	How often nowadays do you have a chance to make money illegally?	3 = few/day,	1.22
		2 = few/ week,	(1.20)
		1 = less than that,	
		0 = no chance	
Criminal embeddedness:			
Friend in full-time hustle (%)	Is closest friend unemployed and involved in drugs, hustles, or trouble with the police?	0 = no,	11.1
		1 = yes	
Arrests experience (and arrests^2) ...	Actual number of arrests		8.2
			(12.0)

Age (and age^2) ……………………	Age	Years	25.71
			(6.6)
Conventional embeddedness:			
Ties to spouse/partner (%) ………	Dichotomous indicator of cohabitation with spouse or partner	0 = no, 1 = yes	20.3
Regular employment (%) …………	Dichotomous indicator of employment in an unsubsidized (nonprogram) job	0 = no, 1 = yes	26.4
Program employment (%) ………..	Dichotomous indicator of Supported Work employment	0 = no, 1 = yes	13.5
School attendance (%) ……………	Dichotomous enrollment indicator for school attendance	0 = no, 1 = yes	5.1
Subjective risks and rewards ………			
Perceived risk of prison ………….	If you made $1,000 illegally, what do you think your chances would be of getting sent to prison if you were caught?	1 = low, 3 = 50/50, 5 = high	3.8 (1.5)
Earnings expectations ……………	If you had to look for a job—keeping in mind your past experiences, your education and your training—how much do you think you would earn per week, before taxes?	1998 U.S.$	499 (250)
Number of person-months …………			93,636

NOTE.—Numbers in parentheses are SDs.

* Average illegal earnings among those with any illegal earnings are $1,121 (SD $3,281).

[†] 3.8% were using heroin, and 4.9% were using cocaine.

$$\$ill_{it} - \overline{\$ill}_i = (a_{it} - \overline{a}_i) + b_1(drug_{it-1} - \overline{drug}_i) + b_2(\$legal_{it-1} - \overline{\$legal}_i)$$

$$+ b_3(\$unearn_{it-1} - \overline{\$unearn}_i) + b_4(incarc_{it} - \overline{incarc}_i)$$

$$+ b_5(unem_{it} - \overline{unem}_i) + b_6(oppty_{it-1} - \overline{oppty}_i)$$

$$+ b_7(devfrd_{it-1} - \overline{devfrd}_i) + b_8(arrest_{it-1} - \overline{arrest}_i)$$

$$+ b_9(arrest_{it-1}^2 - \overline{arrest_i^2}) + b_{10}(age_{it} - \overline{age}_i)$$

$$+ b_{11}(age_{it}^2 - \overline{age_i^2}) + b_{12}(cohab_{it-1} - \overline{cohab}_i)$$

$$+ b_{13}(work_{it-1} - \overline{work}_i) + b_{14}(prog_{it-1} - \overline{prog}_i)$$

$$+ b_{15}(schl_{it-1} - \overline{schl}_i) + b_{16}(risk_{it-1} - \overline{risk}_i)$$

$$+ b_{17}(\$expct_{it-1} - \overline{\$expct}_i) + (\mu_{it} - \overline{\mu}_i).$$

In this model, each variable is expressed as a deviation from its person-specific mean (England et al. 1988; Johnson 1995; Waldfogel 1997). To ensure proper temporal ordering, we lag all independent variables one month, with the exception of incarceration and age (which are measured contemporaneously). We retain periods of incarceration in the analysis because jail stays are often shorter than one month and because illegal earnings may continue while the person is incarcerated (though we report results of analyses that omit all incarceration spells in n. 5 below). Because the model assesses changes within persons, rather than comparing the levels of variables across persons, the effects of stable characteristics are statistically controlled. The individual fixed effects thus remove between-person differences in illegal earnings, leaving the within-person variation to be explained by changes in levels of the variables in our conceptual model—drug use, legal income, opportunities, criminal and conventional embeddedness, and perceptions of risk and reward. For example, the estimated drug effects are the amount that drugs raise or lower illegal earnings above each respondent's own baseline level.

Functional Form of Earnings and Coding of Zero Earners

The proper functional form of earnings is frequently debated in attainment research (Hauser 1980; Hodson 1985; Peterson 1989, 1999; Portes and Zhou 1996). Researchers' choice of raw dollars or its natural logarithm has proven important in both the segmented labor market (Beck, Horan, and Tolbert 1978; Hauser 1980) and immigrant attainment (Portes and Zhou 1996) literatures. Logging dollars reduces skewness and the influence of extreme observations, which generally improves model fit. The esti-

mates in logged models are interpreted as the average percentage change in earnings associated with a unit change on the independent variables.

By contrast, analyzing raw dollars preserves the influence of outliers, which may have significant substantive implications. For example, some effects may be detected only in the full dollar range of earnings (Portes and Zhou 1996) or frequency range of crime (Elliott and Ageton 1980). Coefficients are directly interpreted in these models, as dollar increases or decreases associated with a unit change on the independent variables. In light of this debate, we follow McCarthy and Hagan (2001) in estimating both types of models. We emphasize the raw dollar results for ease of interpretation but discuss differences where they arise in the text and notes.

The coding of zero earners is also an important specification decision (Hauser 1980), and many studies restrict analysis to those earning at least $1 (Portes and Zhou 1996) or $100 (Hodson 1985). Since the transition from $0 to $1 is conceptually important in this case, signaling recidivism or a parole violation for many respondents, we include the zero earners. Because these zero earners skew the earnings distribution and raise important concerns about sample selectivity (Heckman 1979), we also conduct all analyses on an "earners only" subsample. Again, we report all differences in the text or notes.

RESULTS

An Illustrative Case History

To illustrate our data structure, tables 3, 4, and 5 show a simple case history detailing the legal and illegal activities of Paul, a 33-year-old African-American male program participant. We track changes in his drug use, earnings, embeddedness in social relationships, opportunities, and perceptions. Table 3 shows that Paul was jailed for some portion of each of the first five months of the program. Nevertheless, he reported both cocaine use and illegal earnings during this period. Paul entered program work in month 5, earning a monthly income of $433 (in unadjusted dollars). He reported monthly illegal earnings of $867 for six of the first 10 months of the program and used cocaine throughout this period. His drug use escalated to include heroin at the tenth month, and his illegal earnings increased to over $3,000 by month 11. Paul was arrested twice in month 8, and following these arrests he separated from his wife and began to use heroin. His friendship patterns also shifted during this period, such that his best friend was now unemployed and engaged in deviance.

Paul's case shows the changing social circumstances associated with desistance or cessation from crime as well as continuity or growth in

TABLE 3

AN ILLUSTRATIVE CASE HISTORY SHOWING WITHIN-PERSON CHANGES IN EARNINGS AND OTHER CHARACTERISTICS

	MONTH											
VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12
Drugs and money:												
Drug use	cocaine	cocaine	cocaine	cocaine	cocaine	cocaine	cocaine	cocaine	cocaine	cocaine heroin	cocaine heroin	cocaine heroin
Earned legal income ($)	. . .	. . .	. . .	. . .	. . .	433	433	433	433	. . .	. . .	. . .
Earned illegal income ($)	867	867	. . .	. . .	. . .	. . .	867	867	867	867	3,342	3,342
Unearned legal income ($)	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	84	146	146	146
Opportunity structure:												
Incarceration status	yes	yes	yes	yes	yes	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Unemployment rate (%)	11.6	11.6	11.6	11.2	11.2	11.2	11.0	11.0	11.0	10.6	10.6	10.6
Illegal opportunities	high	high	high	high	high	high	high	high	high	high	high	high
Criminal embeddedness:												
Unemployed deviant friend	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	yes	yes	yes	yes
Arrest experience	8	8	8	8	8	8	8	10	10	10	10	10
Age	33.0	33.1	33.2	33.3	33.3	33.4	33.5	33.6	33.7	33.8	33.8	33.9
Conventional embeddedness:												
Ties to spouse/partner	yes	yes	yes	yes	yes	yes	yes	yes	. . .	. . .	. . .	. . .
Regular employment	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Program employment	. . .	. . .	. . .	. . .	yes	yes	yes	yes	yes	. . .	. . .	. . .
School attendance	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Subjective risks and rewards:												
Perceived risk of prison	low	low	low	low	low	low	low	low	low	low	low	low
Earnings expectations	350	350	350	350	350	350	350	350	300	300	300	300

TABLE 4

AN ILLUSTRATIVE CASE HISTORY SHOWING WITHIN-PERSON CHANGES IN EARNINGS AND OTHER CHARACTERISTICS

VARIABLE	MONTH											
	13	14	15	16	17	18	19	20	21	22	23	24
Drugs and money:												
Drug use	cocaine	cocaine	cocaine	cocaine	cocaine	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Earned legal income	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Earned illegal income ($)	2,475	2,475	2,475	2,475	2,475	2,475	2,475	2,475	. . .	. . .	. . .	. . .
Unearned legal income ($)	146	146	146	146	146	146	. . .	. . .	. . .	. . .	. . .	. . .
Opportunity structure:												
Incarceration status	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Unemployment rate (%)	9.3	9.3	9.3	8.6	8.6	8.6	8.3	8.3	8.3	7.6	7.6	7.6
Illegal opportunities	high	high	high	high	high	medium	medium	medium	medium	medium	medium	medium
Criminal embeddedness:												
Unemployed deviant friend	yes	yes	yes	yes	yes	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Arrest experience	10	10	10	10	10	10	10	10	10	10	10	10
Age	34.0	34.1	34.2	34.3	34.3	34.4	34.5	34.6	34.7	34.8	34.8	34.9
Conventional embeddedness:												
Ties to spouse/partner	. . .	. . .	. . .	. . .	. . .	yes	yes	yes	yes	yes	yes	yes
Regular employment	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	yes
Program employment	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
School attendance	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Subjective risks and rewards:												
Perceived risk of prison	low	low	low	low	low	high	high	high	high	high	high	high
Earnings expectations ($)	300	300	300	300	300	300	300	300	300	300	300	300

TABLE 5
AN ILLUSTRATIVE CASE HISTORY SHOWING WITHIN-PERSON CHANGES IN EARNINGS AND OTHER CHARACTERISTICS

	MONTH											
VARIABLE	25	26	27	28	29	30	31	32	33	34	35	36
Drugs and money:												
Drug use	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Earned legal income ($)	1,066	1,066	1,066	840	840	840	840	840	840	840	840	840
Earned illegal income ($) ...	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Unearned legal income	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Opportunity structure:												
Incarceration status	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Unemployment rate (%)	6.2	6.2	6.2	5.6	5.6	5.6	6.9	6.9	6.9	5.1	5.1	5.1
Illegal opportunities	medium	medium	high	high	high	high	high	high	high	high	high	high
Criminal embeddedness:												
Unemployed deviant												
friend	. . .	. . .	yes	yes	yes	yes	yes	yes	yes	yes	yes	. . .
Arrest experience	10	10	10	10	10	10	10	10	10	10	10	10
Age	35.0	35.1	35.2	35.3	35.3	35.4	35.5	35.6	35.7	35.8	35.8	35.9
Conventional embeddedness:												
Ties to spouse/partner	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Regular employment	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Program employment	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
School attendance	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Subjective risks and rewards:												
Perceived risk of prison	high	high	medium	medium	medium	medium	medium	medium	medium	medium	medium	low
Earnings expectations	300	300	800	800	800	800	800	800	800	800	800	260

offending. Table 4 shows that he desisted from crime shortly after ceasing drug use in month 17. He resumed living with his spouse and reported a more conventional best friend at month 18. By the twenty-fourth month, he was working in a regular job as a health services attendant and began reporting legal income of about $1,000 per month. Paul held this job through the end of the follow-up period (table 5) and reported no new illegal income. Nevertheless, he continued to perceive frequent illegal opportunities and to associate with a "deviant" best friend after desisting from crime.

Though tables 3, 4, and 5 provide only a bare outline of Paul's case history, they illustrate his major life events and the sequencing and intensity of his legal and illegal activity. They also show the strengths and limitations of our data and analytical approach. Respondents were interviewed at nine-month intervals and asked to recall their circumstances over the previous nine months.[2] Although these data may be subject to errors in recall and other sources of unreliability (Levitt and Venkatesh 2000; Wilson and Abrahamse 1992), they remain the best source of information on short-term changes in illegal earnings.

Trajectories of Drug Use and Illegal Income

Our fixed-effects analysis considers thousands of these cases simultaneously to test our conceptual model of within-person changes in criminal earnings. Before proceeding, however, we first map some ideal-typical trajectories of drug use and crime, drawing from an important typology of adult male gang members. Hagedorn (1994) reports that some members "go legit" and mature out of gang life, whereas others are "dope fiends" who stay in the gang to maintain access to drugs, or "new jacks" who envision long-term careers as dealers (see also Jacobs 1999; Venkatesh and Levitt 2000). Based on respondents' substance use and illegal earnings at baseline and subsequent follow-up interviews, we developed five basic patterns of drug use: (1) abstainers reported never using cocaine or heroin; (2) desisters had used either cocaine or heroin at baseline, ceased drug use, and did not resume it; (3) new onset users had no history of cocaine or heroin prior to the baseline interview but began drug consumption during the follow-up; (4) sporadic users had periods of alternately using and not using drugs; and, finally, (5) persisters had used cocaine or heroin at baseline and continued throughout the follow-up period.

---

[2] Measures of conventional embeddedness and subjective risks and rewards were also taken at nine-month intervals. Unlike other indicators, however, these measures are fixed within each nine-month period and are therefore less sensitive to month-to-month changes.

We computed an analogous typology of illegal earnings and cross-classify the drug-use and illegal-earnings trajectories in figure 1. We find a strong association between drug-use and illegal-earnings patterns, with about 30% of the total sample desisting and about 18% abstaining from each activity. The next most common pattern involved abstention from drug use and desistance from criminal earnings (complete tables are available upon request).[3] These trajectories show a bivariate relationship between drug use and illegal earnings. To understand how changes in drug use affect illegal income, we move from this across-person perspective to a within-person analysis that nets out stable individual preferences.

Within-Person Predictors of Illegal Earnings

Table 6 shows results of our fixed-effects models predicting monthly illegal earnings.[4] Model 1 includes lagged measures of drug use, legal earnings, and unearned legal income, as well as contemporaneous incarceration and unemployment indicators. Most strikingly, use of cocaine or heroin raises illegal earnings by $678 in the following month, net of the individual fixed effects. Legal earnings reduce criminal gains to some extent, with every legal dollar diminishing illegal earnings by about seven cents. Net of the other variables, unearned income is nonsignificant. Though incarceration dramatically reduces illegal earnings, even this effect is smaller than the positive effect of cocaine or heroin use.[5] The unemployment rate is also a strong positive predictor in model 1, suggesting that people commit more crime when their local labor market is depressed. Each percentage point rise in unemployment corresponds to a $25 increase in monthly illegal earnings.

[3] When we disaggregate drug use by substance, we find few differences in the trajectories, or their relation to illegal earnings, though a slightly higher percentage reported onset of cocaine relative to onset of heroin (available from authors).

[4] We estimated random-effects models as well as fixed-effects models. Because we found large values of the Hausman statistic for each specification, the more demanding assumptions of the random-effects model are unlikely to be met in this research setting. We therefore report results from the more conservative fixed-effects models (Bushway, Brame, and Paternoster 1999; Greene 1997:633).

[5] In a supplementary analysis deleting all incarceration spells (see Piquero et al. 2001), estimates are similar to those in table 6. Cocaine or heroin use raises illegal earnings by $600 to $700, and legal income, regular, and program work significantly decrease them. Because incarceration and opportunity are central to our conceptual model and past research (Levitt and Venkatesh 2001), we also explored this link by creating a running "incarceration counter." We found that each additional month of incarceration reduces illegal income by about $53. In models that include both contemporaneous incarceration and the counter, the latter has a slightly smaller effect (about $43), and the incarceration dummy continues to exert a strong negative effect (about $400) on illegal income.
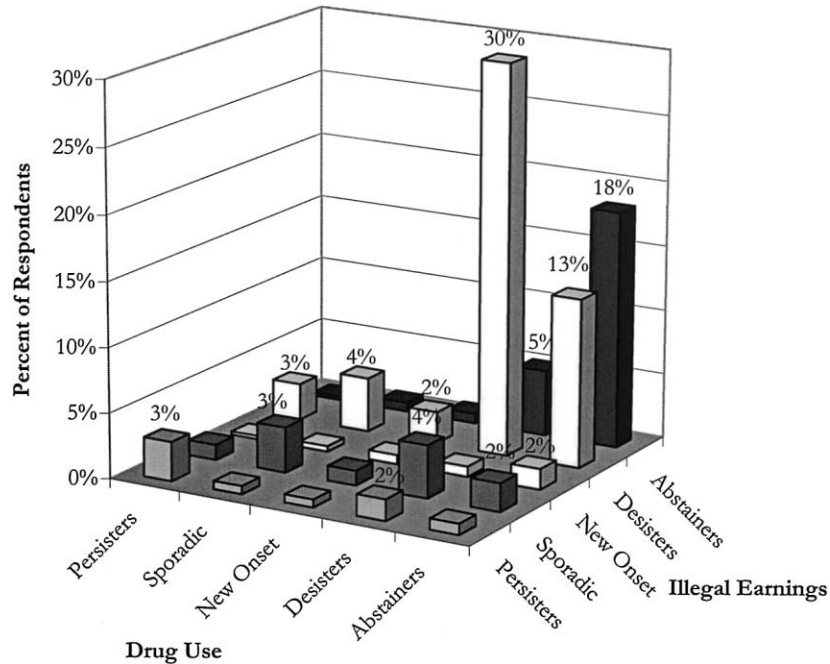
Fig. 1.—Cross-classified individual histories of drug use and illegal earnings ($N = 4,298$).

Model 2 of table 6 adds indicators of criminal and conventional embeddedness and perceived risks and rewards. We expected that establishing close friendships with deviant associates would significantly increase criminal activity, but we find only weak effects once other factors are controlled. We follow standard crime frequency (Osgood et al. 1996) and earnings (Waldfogel 1997) specifications by including squared terms for age and criminal experience. In studies of *legal* earnings, age and experience are typically positive and their squares negative, indicating a pattern of rising and then diminishing returns to experience. We find the same pattern for *illegal* earnings and criminal experience, although age and its square are nonsignificant.[6] Nevertheless, inclusion of both squared

[6] In standard OLS across-person models, age and its square conform to our theoretical expectations. We suspect that age effects in the within-person model may be confounded with the duration structure of recidivism. Our sample is primarily composed of recently released offenders, who are at greatest risk of recidivism immediately after release (in the initial months of the timeline). In the logged version of this model, the main effect of age is statistically significant in model 2. We also conducted a supplementary analysis to gauge the effect of different types of arrest on illegal income (table available from authors). Rather than cumulating all arrests, we distinguished robbery/burglary, drug,

TABLE 6

FIXED-EFFECTS ESTIMATES PREDICTING MONTHLY ILLEGAL EARNINGS (U.S.$)

Variable	Model 1	Model 2
Drugs and money:		
Cocaine or heroin use	678.23**	717.79**
	(25.99)	(28.95)
Earned legal income ($)	−.07**	−.03*
	(.01)	(.01)
Unearned legal income ($)	−.04	−.02
	(.02)	(.02)
Opportunity structure:		
Incarceration status	−469.20**	−506.89**
	(24.52)	(29.13)
Unemployment rate	25.45**	9.75
	(3.99)	(5.41)
Illegal opportunities		1.31
		(7.71)
Criminal embeddedness:		
Ties to unemployed deviant friend		13.32
		(26.03)
Arrest experience		22.79**
		(6.12)
Arrests^2		−1.07**
		(.13)
Age		−54.12
		(39.69)
Age^2		.38
		(.71)
Conventional embeddedness:		
Ties to spouse/partner		−150.66**
		(25.58)
Regular employment		−108.18**
		(23.96)
Program employment		−196.49**
		(26.16)
School attendance		−2.27
		(32.26)
Subjective risks and rewards:		
Perceived risk of prison		−18.23**
		(5.83)
Earnings expectations		−.10*
		(.04)
R^2	.443	.507
N	77,627	60,799

NOTE.—Numbers in parentheses are SEs.
* $P < .05$.
** $P < .01$.

terms significantly improves the model fit over an otherwise identical model that excludes them (not shown).

The conventional embeddedness and subjective measures exert strong and significant effects on criminal earnings. Cohabiting with a spouse or partner reduces illegal earnings by about $150 per month net of the fixed effects and other variables (but see Horney et al. [1995] and Piquero, MacDonald, and Parker [2002] on the differences between marriage and cohabitation effects). Program work and regular work also reduce illegal earnings by $100–$200 per month, and the work variables mediate the effects of the local unemployment rate. Moreover, their significance in models that also include legal earnings indicates strong extraeconomic effects of work on crime.

Among the subjective indicators, increases in perceived risks reduce illegal earnings, implying that crime is responsive to changes in the perceived threat of prison. In contrast, we find that changes in perceived criminal opportunities are unrelated to illegal earnings, although crime and perceived opportunities are closely correlated across persons (Piliavin et al. 1986). As expected, those perceiving higher legal earning potential earn significantly less illegally. The effects of drug use are again strong in model 2, suggesting that drug effects are not mediated by subjective perceptions, conventional and criminal embeddedness, or the other covariates. Overall, the fixed-effects model explains over half of the variation in illegal earnings, which compares favorably to prior research on legal (Portes and Zhou 1996) and illegal (Matsueda et al. 1992; Levitt and Venkatesh 2001) earnings.[7]

DRUG USE AS A FOREGROUND EARNINGS IMPERATIVE

Because of the large magnitude of the drug estimates, and the hypothesized mechanisms linking drug use and illegal income, we focus particular attention on heroin and cocaine use as a foreground earnings imperative.

---

and other arrests. Although our data cannot completely disaggregate these effects, we found that those arrested for more serious offenses experienced the greatest reduction in illegal earnings, likely owing to incapacitation (or possibly deterrence). Each robbery or burglary arrest reduces illegal earnings by approximately $343 the following month, while the effects of drug arrests and other arrests are $163 and $53 respectively.

[7] Because those in the supported work treatment group may have incentives to underreport illegal activity, we investigated the relationship between assignment to supported employment and reported illegal income. We find that rather than underreporting illegal income, those assigned to the treatment status actually report slightly higher levels of illegitimate income. Given the similarity of illegal income reported for both treatment and control groups (e.g., $692 vs. $666 in model 1), it does not appear that respondents who were randomly assigned to a program job significantly underreported criminal earnings (table available from authors).

We present a series of alternative approaches to measuring drug effects: difference models to explore the lag structure of drug use and crime; disaggregated models that consider cocaine and heroin separately; specifications that allow drug effects to cumulate as habits are formed; and others that relax assumptions of the fixed-effects model.

Lag Effects and Difference Specifications

The fixed-effects models deviate the monthly values of each independent variable from their person-specific mean values over the observation period. To estimate the effects of more immediate month-to-month changes, we use a first-difference specification:

$$\Delta\$illeg_i = \Delta\alpha_i + \Delta drug_i + \Delta\$leg_i + incarc_i + \Delta unemploy_i$$

$$+ \Delta\$unearn_i + \Delta\mu_i,$$

where $\Delta\$illeg_i = (\$illeg_{it} - \$illeg_{it-1})$, $\Delta drug_i = (drug_{it-1} - drug_{it-2})$, and so on, and where α_i is an individual fixed effect, and μ_i is a disturbance term. This model also controls for unobserved heterogeneity since all fixed characteristics drop out of the equation by definition. In the difference models shown in table 7, we estimate the effects of drug use, legal earnings, and unearned income, net of incarceration (which is not differenced to capture contemporaneous incapacitation effects) and unemployment.

To examine the lag structure of drug use and crime, we report both a standard first-difference model (in which one month elapses between observations) and a range of longer difference models (in which 2–11 months elapse). In the five equations summarized in table 7, a clear pattern emerges: the greater the duration of the difference, the smaller the effect of drug use on illegal earnings. Model 1 indicates that using drugs in month $(t - 1)$ increases illegal earnings by \$238 among those not using drugs in the previous month. In model 2, this drug effect is reduced to \$206 earned illegally for those not using in month $(t - 3)$, but using in month $(t - 1)$. This implies that drug use has a sizable immediate effect on illegal activity, though further specification is needed to model the effects of the duration of use on illegal earnings.

Cocaine versus Heroin

Though drug effects remain strong and significant in the difference models, they are much smaller than in the fixed-effects specification. To investigate these differences, we disaggregate drug use and vary the functional form of earnings. Table 8 compares results from fixed-effects and first-difference models predicting illegal earnings in logged and unlogged

TABLE 7
DIFFERENCE SPECIFICATIONS

	Model 1 (1–2 Months)	Model 2 (1–3 Months)	Model 3 (1–4 Months)	Model 4 (1–5 Months)	Model 5 (1–12 Months)
Drug use	238.39**	206.42**	168.05**	101.77**	−5.59
Earned	−.02**	−.01*	−.01*	−.01*	−.005
Unearned ...	.04	.02	.006	.002	−.003
N	72,879	68,413	63,980	59,563	33,814

NOTE.—Coefficients are from difference models in which the dependent variable is the difference between the illegal earnings for an individual in one month and the illegal earnings for that individual in the comparison month. The independent variables are expressed as differences as well (but are lagged one additional month to ensure correct temporal ordering) and include drug use, earnings, and unearned income, as well as contemporaneous incarceration status.

* $P < .05$.
** $P < .01$.

form. The logged estimates are stabler, with the fixed-effects and first-difference drug effects closer in magnitude than in the raw dollar equations. Table 8 also suggests that drug effects are not solely attributable to pharmacological properties. Heroin is a narcotic that lowers motor activity and causes drowsiness, whereas cocaine is a stimulant that increases heart rate, blood pressure, and alertness (Akers 1992; Goode 1997). Despite their different physical and psychoactive effects, cocaine and heroin have a comparable impact on illegal earnings ($603 and $769 respectively in fixed-effects and $416 and $470 in the first-difference models), pointing to socioeconomic as well as biochemical mechanisms connecting drug use and crime.[8]

The Length of the Habit

Since habitual users generally develop tolerances to heroin and cocaine, they must gradually increase the dose to maintain a constant effect and stave off withdrawal distress (Becker, Grossman, and Murphy 1991; Lindesmith 1938). Therefore, drug effects on illegal earnings may be tied to the duration of past use as well as to current use. We consider the length of the drug habit in table 9, with duration operationalized as the number of consecutive months of drug use up to and including the current month. In any given month, about 4% of the sample reported heroin use, 5%

[8] We conducted a supplementary analysis of "speedballing" or combined heroin and cocaine use, estimating a fixed-effects model with separate indicators for each drug and an interaction term for use of both substances. In this analysis, the main effects of cocaine and heroin are large and positive and the interaction product term is negative. The effect of heroin alone is similar to the combined effect of both drugs, while the effect of cocaine alone is about $300 smaller.

TABLE 8
Disaggregating Drug Use: Estimated Effects on Illegal Earnings

	Logged		Unlogged	
DRUG	Fixed Effect	First Difference	Fixed Effect	First Difference
Cocaine ...	603	416	500	65
	(181)	(125)		
Heroin	769	470	797	331
	(231)	(141)		
Either	699	443	678	238
	(210)	(133)		

Note.—Estimates for the effect of drug use were taken from regression models that included legal earnings, unearned legal income, incarceration, and the site unemployment rate (see model 1 of table 6 for the full variable list). Estimates for logged models were computed at mean. Numbers in parentheses are percentages; all other numbers are 1998 U.S.$.

cocaine use, and 8% use of either drug (only cocaine, only heroin, or both cocaine and heroin), with an average duration of active use of five months.

Table 9 shows coefficients from fixed-effects models predicting the natural logarithm of illegal earnings.[9] We report the effects of drug use and duration at the mean taken from models that include legal earnings, unearned legal income, incarceration, and the local unemployment rate. Consistent with theories of addiction (Lindesmith 1938), duration effects are especially strong in the drug-specific models. The duration of cocaine use is a strong positive predictor in model 2, with each month of use raising illegal earnings by about $35, net of the fixed effects and the other covariates. When current drug use and the duration term are both included in model 3, this effect is diminished to approximately $13. On average, people increase their illegal earnings by about $562 after their first month of cocaine use ($549 + $13) and about $705 after their twelfth month ($549 + $13[12]). The results for heroin parallel those for cocaine, though heroin has a stronger contemporaneous effect. Illegal earnings rise by about $734 after the first month and about $859 after the first year of uninterrupted heroin use. After 12 months of using either drug (or alternating between them), illegal earnings are a bit lower—about $762 over the person-specific baselines. Although active drug use remains a strong

[9] The estimated duration effects are stabler and less sensitive to the particular specification of the duration parameters in logged models than in raw dollar models.

TABLE 9

CURRENT DRUG USE AND DURATION OF DRUG USE: COEFFICIENTS FROM FIXED-EFFECTS MODELS PREDICTING LOGGED ILLEGAL EARNINGS

DRUGS	COCAINE			HEROIN			EITHER DRUG		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cocaine (effect)	.81**		.66**						
	(603)		(549)						
Duration (monthly effect)		.11**	.04**						
		(35)	(13)						
Heroin (effect)				1.31**		1.17**			
				(769)		(723)			
Duration (monthly effect)					.15**	.03**			
					(49)	(11)			
Either (effect)							1.10**		1.00**
							(699)		(666)
Duration (monthly effect)								.12**	.02**
								(39)	(8)
N	78,341	78,341	78,341	78,449	78,449	78,449	77,627	77,627	77,627
R^2	.489	.488	.490	.494	.491	.494	.499	.495	.499

NOTE.—Effects computed at mean are in parentheses and represented in 1998 dollar amounts. Coefficients are from fixed-effects models that included legal earnings, unearned legal income, incarceration, and unemployment rate (see model 1 of table 6 for the full variable list).

* $P < .05$.
** $P < .01$.

predictor in all models, the large duration effects show how criminal earnings escalate with the duration of use.[10]

Crime and the Cost of Illegal Drugs

The use of expensive illegal drugs appears to create an immediate earnings imperative—a need for quick cash—that increases economic crime. How closely do our estimated drug effects approximate the actual economic needs of serious users? To gauge economic need, we examined monthly expenditures on cocaine and heroin reported by the Drug Use Forecasting (DUF) system. DUF interviews arrestees in 23 U.S. cities about drug expenditures, as well as the frequency of purchases and the amount paid for the most recent purchase (ONDCP 2001, p. 44). These data suggest that chronic cocaine users spent about $870 per month and heroin users about $825 per month in 2000 (again in constant 1998 dollars), figures somewhat higher than our estimated drug effects on illegal earnings of up to $800 per month. Because the real costs of heroin and cocaine were likely higher in the 1970s when Supported Work data were collected (ONDCP 2001), however, the economic needs of chronic users may have been even greater. By all reports, though, the income needs of cocaine and heroin users are sizable and appear to be in line with our estimated drug effects (see, e.g., Johnson et al. 1985).

DISCUSSION

Our analysis suggests that embeddedness in conventional social relationships, licit and illicit opportunities, and subjective perceptions of risks and rewards all influence criminal earnings. We also find strong evidence that drug use is an independent cause of illegal earnings rather than a mere epiphenomenon. We must add, however, that such effects are observed in a historical period in which drug use is criminalized and drugs are expensive relative to the means of users. Under such conditions, chronic heroin and cocaine use create a need for money that is analogous

---

[10] The fixed-effects and difference models assume a recursive relationship—that drug use influences illegal earnings, but not the reverse (Finkel 1995). We relaxed this assumption by using a two-stage least squares (2SLS) first-difference method to model a potential reciprocal relationship. The drug effects of these 2SLS models are of comparable magnitude to those in our fixed-effects models, though the 2SLS estimates are much more sensitive to the particular specification and much less efficient than the fixed-effects or first-difference models (available upon request). In light of these results and the difficulty identifying strictly exogenous instruments, we place greater confidence in the models reported in tables 6–9. Nevertheless, the similar drug effects provide some evidence for the robustness of the models reported above.

to the need for food: a biological, psychological, and social imperative. Apart from statistical significance, the magnitude of drug effects is striking. While incarceration clearly reduces illegal earnings, drug use raises criminal activity as much as incarceration suppresses it.

The Social and Institutional Context of Crime and Drug Use

Though we wish to explain more general social processes, our data are limited to a U.S. recessionary period in the 1970s. How might this limit our generalizations? Table 10 reports changes in crime, punishment, and substance use since these data were collected. When available, we present data for African-American males to correspond to the modal respondent in our sample. First, the African-American male unemployment rate, which rose above 11% in the 1970s, has since fallen significantly. Second, there has been a drastic increase in incarceration and greater criminalization of drug users, both of which impact the opportunity structure for legal and illegal earnings. The African-American male imprisonment rate almost doubled from 1974 to 1986 and doubled again by 2000, with the number serving time for drugs up almost 600% over the period. Thus, economic conditions at the time of data collection were much worse for noninstitutionalized African-American men, yet far more are imprisoned today, especially for drug-related offenses (Western and Beckett 1999). These changes inflate the risks associated with drug use and sales, but they also show the extent to which incarceration has become a common event in the life course for poor minority males (Western and Pettit 2002).

A third related change in social context is the rise of drug courts. In response to drug incarcerations, jurisdictions in 44 states—and all nine cities considered in our analysis—had set aside a specific court for drug offenders by 2000. If such courts deliver on their promise to provide effective treatment, they may decrease the duration of drug use and its effects on illegal earnings (Jofre-Bonet and Sindelar 2002). Alternatively, if these courts do nothing but diminish the risk of prison time, our model suggests that they might increase illegal earnings.

Fourth, our data predate widespread use of crack cocaine, which significantly altered the drug landscape. When crack burst forth in the 1980s, the potential profit to dealers far eclipsed that previously available from street crime. Nevertheless, the rate of self-reported drug use in the United States has not dramatically increased. Instead, cocaine and heroin use has declined since the 1970s, particularly among African-American males. Though the 1980s crack economy forever changed certain aspects of the drug trade (Venkatesh and Levitt 2000), in some ways Supported Work data reflect current conditions. For example, street-level "conduct norms" appear to have passed from gun avoidance in the heroin injection era of

TABLE 10
THE SOCIAL CONTEXT OF THE SUPPORTED WORK DATA AND CHANGES IN THE 1980S
AND 1990S

Characteristic	1970s	1980s	1997–2000
African-American male unemploy-ment rate* (%)	11.4	12.9	7.0
African-American male imprisonment rate[†]	12.4	24.1	48.6
Inmates incarcerated for drugs[‡]	20,681	46,881	124,079
State prisoners incarcerated for drugs[‡] (%)	10.0	8.6	11.0
States with drug courts*	0	0	44
Self-reported drug use (%):[§]			
All:			
Cocaine (any type)	5.5	4.1	1.7
Crack		.5	.5
Heroin	.3	.3	.2
African-American males:[§]			
Cocaine (any type)	8.1	6.3	1.9
Crack		1.7	.8
Heroin	.5	.8	.1
TANF recipients*	11,386,371	10,996,505	5,780,543
% U.S. population receiving TANF*	5.2	4.6	2.1

SOURCES.—Unemployment rate: U.S. Department of Labor (1997, 2002); imprisonment rate: U.S. DOJ (1976, 1986, 2000*a*); drug incarceration: U.S. DOJ (1976, 1988, 2000*b*); drug court data: U.S. DOJ (2002) and U.S. GAO (1997); self-reported drug use: National Institute on Drug Abuse (1997), U.S. Department of Health and Human Services 1999, 2003*a*); Temporary Assistance for Needy Families data: U.S. Department of Health and Human Services (2002, 2003*b*).

* 1970s column uses 1976 data, 1980s column uses 1986 data, 1997–2000 column uses 2000 data.

[†] 1970s column uses 1974 data, 1980s column uses 1986 data, 1997–2000 column uses 2000 data. Numbers shown reflect incarceration per 100,000 population in state prisons across the United States.

[‡] 1970s column uses 1974 data, 1980s column uses 1988 data, 1997–2000 column uses 1997 data.

[§] 1970s column uses 1979 data, 1980s column uses 1988 data, 1997–2000 column uses 1999 data, for U.S. population (age 12 and higher) in the past 12 months.

the 1970s, to the crack generation's "subculture of assault" in the 1980s, and back to a less violent "blunt" or marijuana era beginning in the late 1990s (Johnson, Golub, and Dunlap 2000). Finally, welfare reform in the 1990s may have constricted the opportunity structure for the under- and unemployed, socially isolating impoverished drug users and altering earnings expectations. Today, a significantly smaller percentage of the U.S. population receives public assistance than in the 1970s and 1980s.

Of these social changes, mass incarceration and improved job prospects for those who are not institutionalized may be the most important. Western and Beckett (1999) have shown how U.S. incarceration patterns reduce unemployment in the short run by removing working-age men from the labor force; they also show that this practice diminishes the long-run

earning potential of an ever-larger number of prisoners and former prisoners. Because mass incarceration coincided with the drop in welfare recipients, declining support for social welfare may reflect a broader punitive policy thrust in the United States (Beckett and Western 2001). Nevertheless, despite the considerable social changes since the 1970s, the effect of serious drug use on offending is likely to be relatively stable, because the real costs of drugs remain high relative to the legal earning prospects of users. Similarly, each of the factors specified in our conceptual model is likely to operate today as it did in the 1970s: embeddedness in criminal and conventional activities, opportunities, and the use of prohibitively expensive addictive substances will continue to drive illegal income.

The Generality of Sociological Models of Earnings

By linking theories of crime and theories of attainment, sociologists can benefit from a more parsimonious set of conceptual tools. The danger of such efforts, of course, is "conceptual slippage" in plying such tools for uses outside their practical application. In the present case, however, sociological concepts such as opportunity structure and embeddedness appear well-suited to explaining both illegal and legal earnings. Whether earnings and attainment models adequately account for ill-gotten gains is, in part, an empirical question.

When controlling for all stable individual characteristics and the structure of opportunity, we find that criminal and conventional embeddedness and subjective aspirations generally explain illegal earnings as predicted by sociological attainment models. Indeed, we find unambiguous support for measures of conventional embeddedness; ties to a spouse or partner, employment, and legal earnings generally reduce economic crime. Consistent with informal social control and bonding theories (Hirschi 1969; Laub, Nagin, and Sampson 1998), even month-to-month changes in living arrangements are strong predictors of illegal income. Similarly, while others have shown that those who earn more legally generally earn less illegally (Levitt and Venkatesh 2001; McCarthy and Hagan 2001), our within-person results demonstrate that people actually reduce their illegal earnings below their own baseline level as they become more embedded in conventional activities.

The findings on criminal embeddedness are also instructive. The number of arrests, an indicator of criminal experience, shows the curvilinear relationship observed in models of work experience and legal earnings. Previous research pointed to strong deviant-peer and illegal-opportunity effects (Warr 2002), but we find these to be unrelated to illegal earnings once individual fixed effects and other factors are statistically controlled.

One speculative explanation for the null effects of illegal opportunities and deviant friends is perceptual. In a qualitative study in Liverpool, Shadd Maruna (2001) reports that as offenders desisted from crime, they "differentiated themselves from their 'partners in crime,' seeing their friends as the natural or 'real' criminals." Perhaps former prisoners such as Paul, the man profiled in our case study, judge their surroundings and peers more harshly as their own illegal activity wanes. Whereas a friend may be perceived as straight while one is actively offending, the same person may appear deviant as one desists. Though we cannot confirm such accounts with these data, the results call for more sensitive dynamic studies of within-person change (and, perhaps, Travis Hirschi's [1969] control theory hypothesis that we honor our delinquent associates through conforming rather than deviant behavior).

Of course, there are important differences between processes of legal and illegal attainment, based to some extent on the comparative instability of illegal structures and institutions. For example, drug use does not exert such profound effects on legal earnings (Kandel and Davies 1990), in part because labor markets and firms are relatively unresponsive to intensive short-term income needs. By contrast, criminal earnings may be more sensitive to network ties that determine access to wholesale suppliers of illegal commodities or markets for their disposal. Stronger criminal embeddedness effects are likely to emerge in more representative samples that include those lacking criminal experience or social ties to offenders, or in analyses of across-person difference rather than within-person change. Finally, the risk of punishment fosters secrecy and transience rather than the visible pathways of upward mobility common in conventional careers (Luckenbill and Best 1981). Nevertheless, the core concepts of need, embeddedness, and opportunities are common to both illegal- and legal-earnings determination.

CONCLUSION

The application of sociological models of earnings determination to illegal earnings has shown notable parallels in the two processes and general support for our conceptual model. We also find strong evidence for a causal relationship between heroin and cocaine use and illegal earnings. Specifically, people raise their illegal earnings following serious drug use by approximately $500–$700 per month. Even if offenders overstate their criminal earnings (Wilson and Abrahamse 1992), cocaine and heroin use remains the strongest predictor in each of our multivariate models. We believe that drug use is a basic cause of crime, rather than a mere epiphenomenon, although it remains difficult to disentangle the phenomena.

Foreground characteristics such as drug use, hunger, and other situational factors play an important causal role in criminal participation and remuneration. The sizable drug effects also suggest that effective drug-treatment programs or changes in the law and economics regulating heroin and cocaine may dramatically reduce the social harm associated with crime.

Finally, we note that the within-person picture is much different than the across-person picture revealed in prior investigations (Matsueda et al. 1992; Tremblay and Morselli 2000; Venkatesh and Levitt 2000). That is, the forces driving month-to-month changes in illegal earnings differ from the predictors of the absolute level of illegal earnings at any given time. One way to think about these differences is that the across-person picture identifies correlates of criminality, while the within-person picture points to the shifting life circumstances associated with changes in criminal behavior. People earn less illegally when they are working, when they are living with a spouse, when they associate greater risks with crime, and when the unemployment rate is low in their communities. Such within-person results may help to craft policy interventions by identifying specific factors that, if altered, would induce change in criminal behavior.

In their recent analysis of illegal earnings, McCarthy and Hagan (2001) characterized their key findings—that competence, collaborative relationships, and some forms of human capital increase criminal prosperity—as an unsettling challenge to beliefs about success and participation in conventional activities (p. 1053). Our results regarding change in illegal earnings are perhaps more assuaging. While we too find that criminal experience brings a return in criminal gains, we also identify clear pathways to reducing illegal economic activity and its attendant social harm. As offenders gain more lawful opportunities and become more embedded in work and family relationships, their illegal earnings quickly diminish.

REFERENCES

Akers, Ronald L. 1992. *Drugs, Alcohol, and Society: Social Structure, Process, and Policy*. Belmont, Calif.: Wadsworth.

Anglin, M. Douglas, Yih-Ing Hser, and Chih-Ping Chou. 1993. "Reliability and Validity of Retrospective Behavioral Self-Report by Narcotics Addicts." *Evaluation Review* 17:91–108.

Anglin, M. Douglas, and George Speckart. 1988. "Narcotics Use and Crime: A Multisample, Multimethod Analysis." *Criminology* 26:197–233.

Beck, Elwood M., Patrick M. Horan, and Charles M. Tolbert II. 1978. "Stratification in a Dual Economy: A Sectoral Model of Earnings Determination." *American Sociological Review* 49:454–73.

Becker, Gary S. 1962. "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70 (Supp.): 9–49.

———. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76:169–217.

Becker, Gary S., Michael Grossman, and Kevin Murphy. 1991. "Rational Addiction and the Effect of Price on Consumption." *American Economic Review* 81:237–41.

Beckett, Katherine. 1997. *Making Crime Pay: The Politics of Law and Order in the Contemporary United States*. New York: Oxford University Press.

Beckett, Katherine, and Bruce Western. 2001. "Governing Social Marginality: Welfare, Incarceration, and the Transformation of State Policy." *Punishment and Society* 3: 43–59.

Berk, Richard A., Kenneth J. Lenihan, and Peter H. Rossi. 1980. "Crime and Poverty: Some Experimental Evidence from Ex-Offenders." *American Sociological Review* 45:766–86.

Biblarz, Timothy J., and Adrian E. Raftery. 1999. "Family Structure, Educational Attainment, and Socioeconomic Success: Rethinking the 'Pathology of Matriarchy.'" *American Journal of Sociology* 105:321–65.

Bourgois, Philippe. 1995. *In Search of Respect: Selling Crack in El Barrio*. Cambridge: Cambridge University Press.

Brown, Randall. 1979. *Assessing the Effects of Interview Non-response on Estimates of the Impact of Supported Work*. Princeton, N.J.: Mathematica Policy Research.

Bushway, Shawn, Robert Brame, and Raymond Paternoster. 1999. "Assessing Stability and Change in Criminal Offending: A Comparison of Random Effects, Semiparametric, and Fixed Effects Modeling Strategies." *Journal of Quantitative Criminology* 15:23–61.

Cloward, Richard, and Lloyd E. Ohlin. 1960. *Delinquency and Opportunity*. Glencoe, Ill.: Free Press.

Coleman, James S. 1990. *Foundations of Social Theory*. Cambridge, Mass.: Belknap Press.

Desimone, Jeff. 2001. "The Effect of Cocaine Prices on Crime." *Economic Inquiry* 39: 627–43.

Dickinson, Katherine, with Rebecca Maynard. 1981. *The Impact of Supported Work on Ex-Addicts*. New York: Mathematica Policy Research.

Duneier, Mitchell. 1999. *Sidewalk*. New York: Farrar, Straus & Giroux.

Elliott, Delbert S., and Suzanne S. Ageton. 1980. "Reconciling Race and Class Differences in Self-Reported and Official Estimates of Delinquency." *American Sociological Review* 45:95–110.

England, Paula, George Farkas, Barbara Kilbourne, and Thomas Dou. 1988. "Explaining Occupational Sex Segregation and Wages: Findings from a Model with Fixed Effects." *American Sociological Review* 53:544–59.

Fagan, Jeffrey. 1992. "Drug Selling and Licit Income in Distressed Neighborhoods: The Economic Lives of Street-Level Drug Users and Dealers." Pp. 99–146 in *Drugs, Crime, and Social Isolation*, edited by Adele V. Harrell and George E. Peterson. Washington, D.C.: Urban Institute Press.

———. 1994. "Women and Drugs Revisited: Female Participation in the Cocaine Economy." *Journal of Drug Issues* 24:179–225.

———. 1997. "Legal and Illegal Work: Crime, Work, and Unemployment." Pp. 33–80 in *The Urban Crisis: Linking Research to Action*, edited by Burton A. Weisbrod and James C. Worthy. Evanston, Ill.: Northwestern University Press.

Faupel, Charles E., and Carl B. Klockars. 1987. "Drugs-Crime Connections: Elaborations from the Life Histories of Hard-Core Heroin Addicts." *Social Problems* 34:54–68.

Finkel, Steven E. 1995. *Causal Analysis with Panel Data*. Thousand Oaks, Calif.: Sage.

Gill, Andrew M., and Robert J. Michaels. 1992. "Does Drug Use Lower Wages?" *Industrial and Labor Relations Review* 45:419–34.

Giordano, Peggy C., Stephen A. Cernkovich, and Jennifer L. Rudolph. 2002. "Gender, Crime, and Desistance: Toward a Theory of Cognitive Transformation." *American Journal of Sociology* 107:990–1064.

Glueck, Sheldon, and Eleanor T. Glueck. 1950. *Unraveling Juvenile Delinquency*. New York: Commonwealth.

Goode, Erich. 1997. *Between Politics and Reason: The Drug Legalization Debate*. New York: St. Martin's Press.

Gottfredson, Michael R., and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford, Calif.: Stanford University Press.

Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78:1360–80.

———. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91:481–510.

Greene, William H. 1997. *Econometric Analysis*. 3d ed. Upper Saddle River, N.J.: Prentice-Hall.

Grogger, Jeff. 1998. "Market Wages and Youth Crime." *Journal of Labor Economics* 16:756–91.

Hagan, John. 1991. "Destiny and Drift: Subcultural Preferences, Status Attainment, and the Risks and Rewards of Youth." *American Sociological Review* 56:567–82.

———. 1993. "The Social Embeddedness of Crime and Unemployment." *Criminology* 31:465–91.

Hagan, John, and Bill McCarthy. 1997. *Mean Streets: Youth Crime and Homelessness*. Cambridge: Cambridge University Press.

Hagedorn, John M. 1994. "Homeboys, Dope Fiends, Legits, and New Jacks." *Criminology* 32:197–219.

Hanlon, Thomas E., Timothy W. Kinlock, and David N. Nurco. 1991. "The Drugs-Crime Connection." Pp. 71–90 in *Handbook of Drug Control in the United States*, edited by James A. Inciardi. New York: Greenwood Publishing Group.

Hauser, Robert M. 1980. "On Stratification in a Dual Economy." *American Sociological Review* 45:702–12.

Heckman, James J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47:153–61.

Hindelang, Michael J., Travis Hirschi, and Joseph G. Weis. 1981. *Measuring Delinquency*. Beverly Hills, Calif.: Sage.

Hirschi, Travis. 1969. *Causes of Delinquency*. Berkeley: University of California Press.

Hodson, Randy. 1985. "Some Considerations Concerning the Functional Form of Earnings." *Social Science Research* 14:374–94.

Hollister, Robinson G., Jr., Peter Kemper, and Rebecca A. Maynard. 1984. *The National Supported Work Demonstration*. Madison: University of Wisconsin Press.

Holzer, Harry J., Steven Raphael, and Michael A. Stoll. 2001. "Will Employers Hire Ex-Offenders?" JCPR Working Paper no. 238. Chicago: Joint Center for Poverty Research, Northwestern University/University of Chicago.

Horney, Julie, D. Wayne Osgood, and Ineke Haen Marshall. 1995. "Criminal Careers in the Short Term: Intra-Individual Variability in Crime and Its Relation to Local Life Circumstances." *American Sociological Review* 60:655–73.

Hout, Michael. 1984. "Status, Autonomy, and Training in Occupational Mobility." *American Journal of Sociology* 89:1379–1409.

Huizinga, David, and Delbert S. Elliott. 1986. "Reassessing the Reliability and Validity of Self-Report Delinquency Measures." *Journal of Quantitative Criminology* 2:293–327.

Inciardi, James A., and Anne E. Pottieger. 1994. "Crack-Cocaine Use and Street Crime." *Journal of Drug Issues* 24:273–92.

Jacobs, Bruce. 1999. *Dealing Crack: The Social World of Streetcorner Selling*. Boston: Northeastern University Press.

Jofre-Bonet, Mireia, and Jody L. Sindelar. 2002. "Drug Treatment as a Crime Fighting Tool." NBER Working Paper no. 9038. Cambridge, Mass.: National Bureau of Economic Research.

Johnson, Bruce D., Paul J. Goldstein, Edward Preble, James Schmeidler, Douglas S. Lipton, Barry Spunt, and Thomas Miller. 1985. *Taking Care of Business: The Economics of Crime by Heroin Abusers*. Lexington, Mass.: Lexington Books.

Johnson, Bruce D., Andrew Golub, and Eloise Dunlap. 2000. "The Rise and Decline of Hard Drugs, Drug Markets, and Violence in Inner-City New York." Pp. 164–206 in *The Crime Drop in America*, edited by Alfred Blumstein and Joel Wallman. New York: Cambridge University Press.

Johnson, David R. 1995. "Alternative Methods for the Quantitative Analysis of Panel Data in Family Research: Pooled Time-Series Models." *Journal of Marriage and the Family* 57:1065–77.

Kaestner, Robert. 1991. "The Effect of Illicit Drug Use on the Wages of Young Adults." *Journal of Labor Economics* 9:381–412.

———. 1994. "New Estimates of the Effect of Marijuana and Cocaine Use on Wages." *Industrial and Labor Relations Review* 47:454–70.

Kalleberg, Arne L., and Mark E. Van Buren. 1996. "Is Bigger Better? Explaining the Relationship between Organization Size and Job Rewards." *American Sociological Review* 61:47–66.

Kandel, Denise, Kevin Chen, and Andrew Gill. 1995. "The Impact of Drug Use on Earnings: A Life-Span Perspective." *Social Forces* 74:243–70.

Kandel, Denise B., and Mark Davies. 1990. "Labor Force Experiences of a National Sample of Young Adult Men: The Role of Drug Involvement." *Youth and Society* 21:411–45.

Kowalski, Gregory S., and Charles E. Faupel. 1990. "Heroin Use, Crime, and the 'Main Hustle.'" *Deviant Behavior* 11:1–16.

Laub, John H., Daniel S. Nagin, and Robert J. Sampson. 1998. "Trajectories of Change in Criminal Offending: Good Marriages and the Desistance Process." *American Sociological Review* 63:225–38.

Levitt, Steven D., and Sudhir Alladi Venkatesh. 2000. "An Economic Analysis of a Drug-Selling Gang's Finances." *Quarterly Journal of Economics* 115:755–89.

———. 2001. "Growing Up in the Projects: The Economic Lives of a Cohort of Men Who Came of Age in Chicago Public Housing." *American Economic Review* 91:79–84.

Lindesmith, Alfred R. 1938. "A Sociological Theory of Drug Addiction." *American Journal of Sociology* 43:593–613.

Luckenbill, David F., and Joel Best. 1981. "Careers in Deviance and Respectability: The Analogy's Limitations." *Social Problems* 29:197–206.

MacCoun, Robert, and Peter Reuter. 1992. "Are the Wages of Sin $30 an Hour? Economic Aspects of Street-Level Drug Dealing." *Crime and Delinquency* 38:477–91.

Marini, Margaret Mooney, and Pi-Ling Fan. 1997. "The Gender Gap in Earnings at Career Entry." *American Sociological Review* 62:588–604.

Maruna, Shadd. 2001. *Making Good: How Ex-Convicts Reform and Rebuild Their Lives*. Washington, D.C.: American Psychological Association.

Matsueda, Ross, Rosemary Gartner, Irving Piliavin, and Michael Polakowski. 1992. "The Prestige of Criminal and Conventional Occupations." *American Sociological Review* 57:752–70.

Matsueda, Ross, and Karen Heimer. 1997. "A Symbolic Interactionist Theory of Role Transitions, Role-Commitments, and Delinquency." Pp. 163–241 in *Developmental Theories of Crime and Delinquency, Advances in Criminological Theory*, vol. 7. Edited by Terence Thornberry. New Brunswick, N.J.: Transaction.

McCarthy, Bill. 2002. "New Economics of Sociological Criminology." *Annual Review of Sociology* 28:417–42.

McCarthy, Bill, and John Hagan. 2001. "When Crime Pays: Capital, Competence, and Criminal Success." *Social Forces* 79:1035–59.

Montgomery, James D. 1992. "Job Search and Network Composition: Implications of the Strength-of-Weak-Ties Hypothesis." *American Sociological Review* 57:586–96.
———. 1994. "Weak Ties, Employment, and Inequality: An Equilibrium Analysis." *American Journal of Sociology* 99:1212–36.

National Institute on Drug Abuse. 2002. "National Household Survey on Drug Abuse, 1979" [Computer file]. ICPSR version. Princeton, N.J.: Response Analysis Corporation/Research Triangle Park, N.C.: Research Triangle Institute [producers], 1995. Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research [distributor], 1997.

Needle, Richard H., and A. Mills. 1994. *Drug Procurement Practices of the Out-of-Treatment Chronic Drug Abuser*. National Institutes of Health Publication no. 94-3820. Rockville, Md.: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

Newman, Katherine. 1999. *No Shame in My Game: The Working Poor in the Inner City*. New York: Knopf.

Nollen, Stanley D., and Karen H. Gaertner. 1991. "Effects of Skill and Attitudes on Employee Performance and Earnings." *Industrial Relations* 30:435–55.

Nurco, David N., Thomas E. Hanlon, Timothy W. Kinlock, and Karen R. Duszynski. 1988. "Differential Criminal Patterns of Narcotic Addicts over an Addiction Career." *Criminology* 26:407–23.

Office of National Drug Control Policy. 2001. *What America's Users Spend on Illegal Drugs, 1998–2000*. Washington, D.C.: Government Printing Office.

Osgood, D. Wayne, Janet K. Wilson, Patrick M. O'Malley, Jerald G. Bachman, and Lloyd D. Johnston. 1996. "Routine Activities and Individual Deviant Behavior." *American Sociological Review* 61:635–55.

Padilla, Felix. 1992. *The Gang as an American Enterprise*. New Brunswick, N.J.: Rutgers University Press.

Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology* 108:937–75.

Peterson, Trond. 1989. "The Earnings Function in Sociological Studies of Earnings Inequality: Functional Form and Hours Worked." *Research in Social Stratification and Mobility* 8:221–50.
———. 1999. "Functional Form for Continuous Dependent Variables: Raw versus Logged Form." Paper presented at the annual meetings of the American Sociological Association, August 9, Chicago.

Piliavin, Irving, Rosemary Gartner, Craig Thornton, and Ross Matsueda. 1986. "Crime, Deterrence, and Rational Choice." *American Sociological Review* 51:101–19.

Piquero, Alex R., Alfred Blumstein, Robert Brame, Rudy Haapenen, Edward P. Mulvey, and Daniel S. Nagin. 2001. "Assessing the Impact of Exposure Time and Incapacitation on Longitudinal Trajectories of Criminal Offending." *Journal of Adolescent Research* 16:54–74.

Piquero, Alex R., John M. MacDonald, and Karen F. Parker. 2002. "Race, Local Life Circumstances, and Criminal Activity." *Social Science Quarterly* 83:654–70.

Piquero, Alex R., Randall MacIntosh, and Matthew Hickman. 2002. "The Validity of Self-Reported Delinquency Scale: Comparisons across Gender, Age, Race, and Place of Residence." *Sociological Methods and Research* 30:492–529.

Portes, Alejandro, and Min Zhou. 1996. "Self-Employment and the Earnings of Immigrants." *American Sociological Review* 61:219–30.

Raffalovich, Lawrence E., Kevin T. Leicht, and Michael Wallace. 1992. "Macroeconomic Structure and Labor's Share of Income: United States, 1950 to 1980." *American Sociological Review* 57:243–58.

Rytina, Steven. 2000. "Is Occupational Mobility Declining in the U.S.?" *Social Forces* 78:1227–76.

Sakamoto, Arthur, and Meichu D. Chen. 1991. "Inequality and Attainment in a Dual Labor Market." *American Sociological Review* 56:295–308.

Sampson, Robert, and John Laub. 1990. "Crime and Deviance over the Life Course: The Salience of Adult Social Bonds." *American Sociological Review* 55:609–27.

———. 1993. *Crime in the Making: Pathways and Turning Points through Life*. Cambridge, Mass.: Harvard University Press.

Schore, Jennifer, Rebecca Maynard, and Irving Piliavin. 1979. *The Accuracy of Self-Reported Arrest Data*. Princeton, N.J.: Mathematica Policy Research.

Shover, Neil. 1996. *Great Pretenders: Pursuits and Careers of Persistent Thieves*. Boulder, Colo.: Westview.

Sobel, Michael E. 1996. "An Introduction to Causal Inference." *Sociological Methods and Research* 24:353–67.

Steffensmeier, Darrell. 1986. *The Fence: In the Shadow of Two Worlds*. Boston: Rowman & Littlefield.

Sullivan, Mercer. 1989. *Getting Paid: Youth Crime and Work in the Inner City*. Ithaca, N.Y.: Cornell University Press.

Sutherland, Edwin. 1937. *The Professional Thief: By a Professional Thief*. Annotated and interpreted by Edwin Sutherland. Chicago: University of Chicago Press.

———. 1947. *Principles of Criminology*, 4th ed. Philadelphia: J.B. Lippincott.

Taylor, Bruce, and Trevor Bennett. 1999. *Comparing Drug Use Rates of Detained Arrestees in the United States and England*. National Institute of Justice. Washington, D.C.: Government Printing Office.

Tremblay, Pierre, and Carlo Morselli. 2000. "Patterns in Criminal Achievement: Wilson and Abrahamse Revisited." *Criminology* 38:633–60.

Uggen, Christopher. 2000. "Work as a Turning Point in the Life Course of Criminals: A Duration Model of Age, Employment, and Recidivism." *American Sociological Review* 65:529–46.

Uggen, Christopher, and Melissa Thompson. 1999. *National Institute of Justice Final Report: Careers in Crime and Substance Use*. NCJ no. 182362. Rockville, Md.: National Institute of Justice.

U.S. Department of Health and Human Services. 1999. National Institute on Drug Abuse. "National Household Survey on Drug Abuse, 1988." [Computer file]. 2d ICPSR version. Research Triangle Park, N.C.: Research Triangle Institute [producer], 1990. Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research [distributor].

———. 2002. "Temporary Assistance for Needy Families (TANF) Percent of Total U.S. Population, 1960–1999." Administration for Children and Families. Retrieved February 14, 2002 (www.acf.dhhs.gov/news/stats/6097rf.htm).

———. 2003*a*. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. "National Household Survey on Drug Abuse, 1999." [Computer file]. 2nd ICPSR version. Research Triangle Park, N.C.: Research Triangle Institute [producer], 2002. Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research [distributor].

———. 2003*b*. *Temporary Assistance for Needy Families Program (TANF)*. Fifth Annual Report to Congress. Washington, D.C.: Government Printing Office.

U.S. Department of Labor. 1997. *BLS Handbook of Methods*. Washington, D.C.: Government Printing Office.

———. 1998. "Consumer Price Index: All Urban Consumers, U.S. City Average." Bureau of Labor Statistics. Retrieved July 2, 2002 (ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt).

———. 2002. "Labor Force Statistics from the Current Population Survey." Bureau of Labor Statistics. Retrieved February 19, 2002 (http://stats.bls.gov/data/home.htm).

U.S. DOJ (Department of Justice). 1976. *Sourcebook of Criminal Justice Statistics*. Washington, D.C.: Government Printing Office.

———. 1986. *Correctional Populations in the U.S*. Washington, D.C.: Government Printing Office.

———. 1988. *Correctional Populations in the U.S*. Washington, D.C.: Government Printing Office.

———. 2000*a*. *Sourcebook of Criminal Justice Statistics*. Washington, D.C.: Government Printing Office.

———. 2000*b*. *Survey of State Prison Inmates, 1997*. Washington, D.C.: Government Printing Office.

———. 2001. *Sourcebook of Criminal Justice Statistics*. Washington, D.C.: Government Printing Office.

———. 2002. *Summary of Drug Court Activity by State and Country*. Washington, D.C.: Government Printing Office.

U.S. GAO (General Accounting Office). 1997. *Drug Courts: Overview of Growth, Characteristics, and Results*. Washington, D.C.: Government Printing Office.

VanNostrand, Lisa-Marie, and Richard Tewksbury. 1997. "The Motives and Mechanics of Operating an Illegal Drug Enterprise." *Deviant Behavior* 20:57–83.

Venkatesh, Sudhir. 1997. "The Social Organization of Urban Street Gang Activity." *American Journal of Sociology* 103:82–111.

Venkatesh, Sudhir A., and Steven D. Levitt. 2000. "'Are We a Family or a Business?' History and Disjuncture in the Urban American Street Gang." *Theory and Society* 29:427–62.

Wacquant, Loïc. 2002. "Scrutinizing the Street: Poverty, Morality, and the Pitfalls of Urban Ethnography." *American Journal of Sociology* 107:1468–1532.

Waldfogel, Jane. 1997. "The Effect of Children on Women's Wages." *American Sociological Review* 62:209–17.

Warr, Mark. 1998. "Life-Course Transitions and Desistance from Crime." *Criminology* 36:183–216.

———. 2002. *Companions in Crime: The Social Aspects of Criminal Conduct*. Cambridge: Cambridge University Press.

Western, Bruce. 2000. "The Impact of Incarceration on Earnings and Inequality." Paper presented at the annual meetings of the American Sociological Association, August 15, Washington, D.C.

Western, Bruce, and Katherine Beckett. 1999. "How Unregulated Is the U.S. Labor Market? The Penal System as a Labor Market Institution." *American Journal of Sociology* 104:1030–60.

Western, Bruce, and Becky Pettit. 2002. "Beyond Crime and Punishment: Prisons and Inequality." *Contexts* 1:37–43.

White, Helene Reskin, Robert J. Pandina, and Randy L. LaGrange. 1987. "Longitudinal Predictors of Serious Substance Use and Delinquency." *Criminology* 25:715–40.

Wilson, James Q., and Allan Abrahamse. 1992. "Does Crime Pay?" *Justice Quarterly* 9:359–77.