

The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title: Gender, Mental Illness, and Crime

Author: Melissa Thompson

Document No.: 224028

Date Received: September 2008

Award Number: 2007-IJ-CX-0004

This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant final report available electronically in addition to traditional paper copies.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

GENDER, MENTAL ILLNESS, AND CRIME

Grant No. 2007-IJ-CX-0004

FINAL TECHNICAL REPORT

September 15, 2008

Submitted by:

Melissa Thompson

Portland State University
Department of Sociology
P.O. Box 751
Portland, OR 97207

This project was supported by Grant No. 2007-IJ-DX-0004 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. Findings and conclusions of the research reported here are those of the author and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
RATIONALE/AIMS FOR THE PROJECT.....	7
STATE OF CURRENT KNOWLEDGE	8
Gender and Crime	8
Gender and Mental Illness	9
Gender, Crime, and Mental Illness	10
Negative Affect and Crime	11
THE DATASET AND ANALYTIC STRATEGY	11
Independent Variables	12
Dependent Variables	12
Analysis Plan	13
DESCRIPTIVE STATISTICS	14
STAGE ONE FINDINGS	16
Demographic and Structural Variables	16
Depression and Drug Use.....	18
Gendered Effects of Drug Use and Depression on Crime	19
Depression, Drug Use, and Any Arrest.....	21
Drug-Specific Analyses.....	22
Depression, Types of Drug Use, and Any Arrest.....	24
Offense Specific Analyses.....	24
Depression, Drugs, and Arrest Types.....	26
Two-Stage Least Squares Regression Analysis	28
Summary of Stage One Findings.....	29
STAGE TWO FINDINGS	30
Treatment Providers and Completion of Treatment.....	37
Sample Selection Models	39

Summary of Stage Two Findings	40
STAGE THREE FINDINGS	40
Sample Selection Models	44
Summary of Stage Three Findings	45
LINKING KEY FINDINGS TO THE LITERATURE.....	45
Depression, Drug Use, and Crime.....	45
Self-Medication and Crime	50
Treatment and Crime.....	50
LIMITATIONS OF THE DATA AND THE ANALYSIS	52
CONCLUSIONS AND IMPLICATIONS OF FINDINGS	54
REFERENCES	58
ENDNOTES	65

GENDER, MENTAL ILLNESS AND CRIME

Grant No. 2007-IJ-CX-0004

EXECUTIVE SUMMARY

This report summarizes our recent examination of the gendered effects of depression, drug use, and treatment on crime and the effects of interaction with the criminal justice system on subsequent depression and drug use. We analyze data gathered in 2004 as part of the National Household Survey on Drug Use and Health (NSDUH), a nationally representative survey of respondents aged 12 years or older. Respondents provided detailed information regarding illegal drug use, criminal activity, depression, and other factors. By examining the gender differences in the relationships between these key variables, we are able to understand how men and women differently experience depression, drug use, and crime.

Criminology, sociology, and criminal justice literature point to an important link between mental illness (particularly depression and drug abuse) and crime; however, the degree to which gender alters these relationships has not yet been demonstrated. This study focuses on the gendered relationships between depression, substance abuse, and crime using data from the NSDUH, given to members of the non-institutionalized U.S. civilian population aged 12 or older. Logistic regression models predicting the odds of crime, drug use, and depression are estimated for male and female respondents; z-tests are then used to formally test for gender differences. Our statistical analyses focus on explaining behavior in the most recent 12 months, emphasizing current factors in the respondents' lives that explain their criminal activity, depression, and drug use. The models also include a measure of deviant behavior from previous years to control for an individual's deviant propensity. The results of this report therefore provide strong evidence regarding the role of gendered drug use, depression, and crime.

Our analyses were conducted in three separate stages. Stage one highlights how gendered differences in self-reported mental illness and substance abuse affect the self-reported criminal behaviors of theft, drug sales, and/or assault. The second stage focuses on how gendered differences in treatment for depression and substance dependency affect self-reported crime. Because women are significantly more likely to seek psychiatric treatment than men (Hankin 1990), and men are more likely than women to receive treatment for illicit drugs (SAMHSA 2003), it is important to consider how these gender differences in treatment affect criminal behavior. The third stage focuses on how gender differences in interaction with the criminal justice system affects depression and substance use.

Key findings from stage one include:

Illegal Drug Use and Crime

- Use of an illegal drug in the past year significantly increases crime.
- This past year drug use is especially likely to increase crime among women.
- Past year drug users are especially prone to engage in drug sales, and this is equally true for men and women.
- Women who used in the last year are also especially prone to engage in assault.
- Use of an illegal drug historically (prior to one year ago) also tends to increase crime, suggesting that individuals who have a longer history of drug use are particularly prone to engage in crime.

Depression and Crime

- Depressed individuals commit more crime than non-depressed individuals.
- Depression is especially a risk factor for women to engage in crime.
- Depressed women are especially prone to commit assault.

Key findings from stage two include:

Depression, Self-Medication, and Crime

- Individuals who self-medicate by taking illegal substances for their depression are less likely to commit crime than those who do not self-medicate.
- Self-medication reduces women's crime more so than men's.

Drug Dependency, Treatment, and Crime

- Overall, treatment for drug dependency appears to increase crime.
- Drug treatment for older individuals, however, reduces the likelihood of crime.
- There are no apparent gender differences in the effect of drug treatment on crime.

Depression, Treatment, and Crime

- The administration of antidepressants appears to increase crime rates.
- Among older individuals, however, antidepressant medication reduces crime.
- Among younger individuals, antidepressant medication is particularly likely to increase women's likelihood to engage in drug sales.

Key findings from stage three include:

Criminal Justice Contact and Depression

- Individuals who have contact with the criminal justice system via arrest, being arrested more often, and being on probation or parole are more likely to be depressed.
- A history of contact with the criminal justice system increases depression for men more so than for women.

Criminal Justice Contact and Illegal Drug Use

- Individuals who have contact with the criminal justice system via arrest, being arrested more often, and being on probation or parole are more likely to use illegal drugs.
- A history of contact with the criminal justice system increases illegal drug use for women more so than for men.

Discussion and Recommendation for Future Research and Policy

This research demonstrates that being depressed and using illegal substances significantly increases criminal behavior for both men and women, although they are both especially problematic for women. This would seem to imply that the policy recommendation be for additional treatment for drug dependency and depression, particularly to prevent crime among women. This is problematic, however, because this research also finds that treatment for substance dependency and/or depression has little impact on reducing crime, and may instead increase crime rates. The exception to this finding is for older respondents, who are less likely to engage in crime after receiving either depression or substance abuse treatment, and these results are similar for men and women. It appears that one-size-fits all treatment for substance abuse and depression may cause more problems than we might expect. Instead, treatment—at least as antidepressants and substance abuse treatment currently stand—may be useful primarily for older, more emotionally mature individuals. This suggests that future social policy seek age-appropriate treatments for dealing with these mental health difficulties.

We do find that women who self-medicate by treating their depression with illegal substances are considerably less likely to engage in crime than women do not self-medicate. We

believe that, by self-medicating, these women are likely to alleviate some of the most serious symptoms of their depression, resulting in a lower rate of crime compared to those who are depressed but do not self-medicate. Ultimately, however, this positive outcome is unlikely to be sustained as individuals become addicted to these substances and feel the need to engage in additional criminal activity to maintain this addiction. This is something we are unable to examine using these data, however, and future research should continue to examine this relationship between self-medicating and lower rates of crime among women.

This research also demonstrates that individuals who have contact with the criminal justice system tend to be more depressed and more likely to engage in illegal substance use than individuals who have no criminal justice contact. This criminal justice contact is particularly likely to increase men's depression, and women's illegal drug use. These findings therefore point to a need to be aware of the effects of criminal justice interventions on the mental health of offenders. Individuals who are arrested and under correctional supervision are likely to face high levels of stress associated with embarrassment, loss of income, family disapproval, worry regarding pending court cases, and many other factors. This does not mean to suggest that criminal justice interventions should not occur when a crime is committed, but instead, to suggest that future criminal activity may be prevented by efforts to reduce or eliminate as many of these stressors as possible. This might include lower bail, or shorter sentences, allowing these individuals to return to their families, workplaces, or schools as soon as possible.

Future research, using longitudinal data, should be conducted to better understand the sequence and timing of the events examined in this project. Nevertheless, the evidence presented here suggests that depression and illegal drug use increase criminal propensity and that these stressors are particularly important in explaining women's crime. Current treatment efforts do

not appear to address these links between depression, drug use, and crime. Future research and policy should attempt to address the gendered nature of the relationship between mental illness (including depression and drug use) and criminal activity.

GENDER, MENTAL ILLNESS, AND CRIME

DRAFT TECHNICAL REPORT

GRANT NO. 2007-IJ-CX-0004

RATIONALE/AIMS FOR THE PROJECT

Criminology, sociology, and criminal justice literature point to an important link between mental illness (particularly depression and drug abuse)¹ and crime; however, the degree to which gender alters these relationships has not yet been demonstrated. This study establishes the role of gender differences in the effect of mental illness on crime. This study builds on previous research noting that corrections officials are significantly more likely to perceive mental illness in violent female offenders as compared to similar male offenders (Thompson 2005). Data from the 2004 National Survey on Drug Use and Health (NSDUH) is used for the analysis. By highlighting the importance of gender as a mediating factor altering the effects of depression and drug use on criminal behavior, the major findings contribute substantially to the administration of justice and public safety.

The available evidence makes it clear that men are much more likely than women to be found in the population of criminal offenders. Volumes of research indicate that while men are typically socialized to act out violently or aggressively against others (often resulting in crime and substance abuse) women are typically socialized to direct distress inward, in a “feminine” manner (often resulting in depression and other mental illnesses). Consequently, previous research indicates that while men typically respond to distress with externalizing behavior, women typically respond with internalizing behavior (Rosenfield 1999; De Coster 2005). What is not yet known, however, is the degree to which mental illness (including depression and

substance use) alters this relationship between gender and crime. We address these limitations in the literature by directly examining the gendered relationship between mental illness and crime, establishing the effects of depression and substance use on female crime as compared to male crime.

STATE OF CURRENT KNOWLEDGE

Criminal offending, depression, and illegal substance use are recognized as important social problems warranting prevention and intervention efforts. Although there is some evidence for comorbidity between these issues, there is a paucity of research examining these relationships, especially as they pertain to gender differences. The literature that is available has consistently demonstrated that male crime and substance use rates exceed female crime and substance use rates, and that women's rates of depression are considerably higher than men's rates.

Gender and Crime

Together with age, gender is one of the most consistent predictors of crime (Hagan et al. 1985; Farnworth & Teske 1995); men are more involved than women in criminal activity "always and everywhere" (Gottfredson & Hirschi 1990:145). With recent increases in the female percentage of arrests (Steffensmeier & Allan 1996), convictions (Nagal & Johnson 1994), and incarcerations (U.S. Department of Justice 1998), a great deal of attention has focused on the "new" type of criminal: women. This gendered convergence in arrests, however, primarily involves proportionately greater female involvement in minor property crimes (Steffensmeier & Allan 1996).

According to Feeley and Little (1991), women constituted a “substantial portion” of felony indictments (ranging from larceny to murder) in much of the 18th century. While the female share of indictments declined thereafter, it appears that other methods of social control picked up the slack (Feeley & Little 1991; see also Boritch & Hagan 1990). Changing economic structures removed women from the formal economy and placed them under the supervision of their husbands (Feeley & Little 1991). At the same time, women increasingly became subject to the control of insane asylums, with women viewed as “not bad but mad” (Zedner 1991:264). This “new” conception of female offenders as “feeble-minded” resulted in a significant decline in the female prison population in the early 20th century (Zedner 1991). To some extent, this portrayal of women criminals as mentally deficient has endured into contemporary criminal justice (Worrall 1990; Zedner 1991:296; Thompson 2005).

Gender and Mental Illness

Although there appear to be no gender differences in the overall *rates* of mental disorder, men and women do differ in the *type* of disorder experienced (Dohrenwend & Dohrenwend 1976; Kessler & McLeod 1984; Hankin 1990; Aneshensel et al. 1991; Rosenfield 1999). With respect to gender differences for specific diagnoses, women have higher rates of depression and anxiety disorder (referred to as “internalizing” disorders), while men have higher rates of substance abuse and antisocial disorders (also called “externalizing” disorders) (Robins et al. 1991; Potts et al. 1991; Kessler & Shanyang 1999; Rosenfield 1999).

Current explanations for these gender differences (internalizing versus externalizing) refer to divisions in power and responsibilities—women earn less than men, tend to have jobs with less power and autonomy, and are more responsive to the problems of people in their social networks—all of which contribute to psychological distress on the part of women (Kessler &

McLeod 1984; Brown & Harris 1989; Rosenfield 1989; Aneshensel et al. 1991; Horwitz et al. 1998; Rosenfield 1999; Thoits 1999; Turner & Lloyd 1999). Although women are encouraged to act out their distress in an emotional or dependent manner, men are socialized into acting out, or externalizing their distress, through substance abuse or antisocial behavior.

Gender, Crime, and Mental Illness

Though complicated, there does appear to be a relationship between gender, crime, depression, and substance use. Available research makes it clear that women are more likely to be depressed than men (Mirowsky 1996); in contrast, men are significantly more likely than women to be involved in substance abuse and crime (Steffensmeier & Allan 1996; Rosenfield 1999). Prior research also suggests that depressed persons are likely to self-medicate with alcohol or drugs, and that women are particularly likely to use these substances to “get away from emotional pain” (Toray et al. 1991:339).

Illegal drug use is often associated with illegal earnings (ONDCP 2001), with a significant portion of drug use supported by criminal activity (Inciardi & Pottieger 1994; Jacobs 1999; Kowalski & Faupel 1990). Fagan, for example, finds that female crack cocaine users report far more income-generating crime than non-users (1994). Similarly, Johnson and colleagues identify a powerful “direct contribution” of current heroin use to criminal income (1985:159). In conjunction with research indicating that economic factors such as unemployment and low income increase both depression (Dooley et al. 2000) and criminal activity (Uggen & Thompson 2003), further research into the complex relationship between depression, substance use, crime, and gender is necessary.

One possible explanation for women’s higher rate of depression, but not crime, is that women are significantly more likely than men to seek psychiatric treatment (Hankin 1990).

Thus, the possible link between depression, self-medication, and crime may be broken by mental health and substance abuse interventions. This link, which has yet to be tested, is examined in greater detail in this study.

Negative Affect and Crime

Agnew's general strain theory of crime suggests that those experiencing negative affect or emotions will be more likely to engage in crime and delinquency (1992). Agnew's theoretical approach focuses on negative relationships and how these negative relationships push individuals into criminal adaptations. Agnew's model suggests that there are three major types of negative relations that cause strain: (1) those that jeopardize the achievement of positively valued goals, (2) those that remove or threaten to remove positively valued stimuli, and (3) those that present one with negatively valued stimuli (Agnew 1992; 1995). Agnew's contention is that, in the face of stress, crime and delinquency serve as effective coping mechanisms. In this study, stress is operationalized as the stress of severe depression or a substance abuse problem; these types of mental disorders are likely to cause all three types of strain Agnew discusses, and will therefore, in the absence of appropriate modifiers, result in a greater likelihood of criminal activity.

THE DATASET AND ANALYTIC STRATEGY

This analysis highlights how gendered differences in self-reported mental illness and substance abuse affect self-reported criminal behavior. Data for this report come from the 2004 *National Survey on Drug Use and Health* (NSDUH) (U.S. Department of Health & Human Services 2006). The 2004 NSDUH is the 24th in a series, with the primary purpose to measure the prevalence and correlates of drug use in the United States. The sample is drawn from the civilian, noninstitutionalized population who were 12 years of age or older at the time of the

survey. The design over-sampled youths and young adults, making it especially likely that this data captures the ages at which youths enter into their highest rates of criminal offending and substance use—the late teens and into the early 20s (see, e.g., Gottfredson and Hirschi 1990). The 2004 NSDUH response rate was a high 91 percent (U.S. DH&HS 2004). Interviews were carried out using computer-assisted interviewing (CAI) methods, designed to provide respondents with a highly private and confidential means of responding to questions, thereby increasing the level of honest reporting of illicit drug use and other sensitive behaviors (U.S. DH&HS 2004). Demographic data are available on the respondents, in addition to self-reported depression, crime, and illegal drug use.

Independent variables

The NSDUH asked respondents many questions about depression and substance use. Due to concerns about the relatively small frequency of illegal substance use when each of the drug use variables are considered separately, this research focuses on three primary groups of illegal substances: marijuana, cocaine/crack, and other illicit drugs; we primarily use a measure of “any illegal drug use.” The distribution of these variables enables robust models, even when parceled out into male and female models (see Exhibit 1 on page 15 for the frequencies of the key independent and dependent variables). These indicators are used in conjunction with gender and other important controls for socioeconomic and family statuses to determine their gendered effects on criminal behavior.

Dependent variables

The NSDUH asked respondents to report committing any of three offenses (drug sales, property, or violent crime) within the past twelve months. These three offense categories, in addition to a global indicator of *any* criminal activity, are examined to understand whether

gender interacts with depression and/or substance use to make some offenses particularly likely.

Due to the relatively small number of respondents reporting each of these behaviors within the past year, however, most of our analyses focuses on the indicator of *any* crime, which results in a larger number of respondents reporting criminal activity.

Analysis Plan

Logistic regression (for a binary measure of offense presence/absence) models are estimated. These models are estimated separately for females and males, and *z*-tests are used to assess whether the regression coefficients for the independent variables differ across gender (see Paternoster et al. 1998 for the suggested *z* test equation). Further analyses include interaction terms between demographic variables and key variables such as treatment for depression and substance use. This research focuses on whether depression and substance use play a significantly different role in contributing to property, violent, drug sale, and “all” crime for women as compared to men. We also consider how treatment for these problems affects crime and how criminal justice interventions contribute to subsequent depression and substance use.

The NSDUH is a cross-sectional database that primarily inquired about behavior and characteristics in the past year. Because the sequencing of events is a relevant concern for this research (e.g., does depression come before or after criminal behavior?), we attempt to include the correct temporal ordering in all of our analyses. Our approach to temporal ordering was to, whenever possible, use as independent (predictor) variables measures of lifetime behavior or behavior that occurred more than 12 months ago (prior to the interview). For our dependent variables, we always use measures of past year (as of the interview) behavior. Although not perfect, by using a measure of lifetime depression (for example), we are indicating that the respondent met the criteria for a major depressive episode at some point during their lifetime. In

many instances this depression would have occurred prior to the past 12 months and therefore prior to the criminal behavior of interest in the dependent variable.²

DESCRIPTIVE STATISTICS

Descriptive statistics are presented in Exhibit 1. The sample is approximately 52% female and 12% African American. The majority of the non-African American group is white.³ The sample has a mean age between 26 and 34 years and a mean educational attainment of 12th grade. About 64% of the sample participates in the work force on some level, and the mean income category for respondents is \$20,000-30,000 a year. About half (51%) of the respondents are married, and almost a third (30%) have children at home. Depression, measured as a major depressive episode experienced at least once in the respondent's lifetime, affects almost 15% of the sample.

In the 12 months prior to the survey, almost 15% of respondents had used some type of illicit substance at least once. Marijuana was the most commonly used substance, with about 11% of the sample having used it in the last year. Cocaine and other illicit substances were less common, at about 2% and about 7% respectively. When looking at historical use, the numbers are much higher, with about 45% of the sample having used an illicit substance greater than 12 months ago. About 4% of the sample reported committing a crime in the last year. The most common crime was assault, at just over 2%. The second most common was drug sales, at under 2%, followed by theft at just over 1%. About 2% of respondents reported being arrested for a crime in the past year.

Exhibit 1: Descriptive Statistics (N = 34,447 listwise deletion)

Variable	Description	TOTAL Mean/Percent	Males	Females
<i>Dependent Variables</i>				
Self-reported drug sales	1=Drug sales past year; 0=No drug sales	1.9%	2.8%	1.1%
Self-reported assault	1=Assault past year; 0=No assault	2.2%	2.8%	1.6%
Self-reported theft	1=Theft past year; 0=No theft	1.2%	1.6%	1.0%
Any self-reported crime	1=Any crime past year; 0=No crime	4.1%	5.6%	2.8%
Any current arrest	1=Arrested for any crime in the past 12 months; 0=No arrest in past 12 months	2.0%	3.6%	1.4%
<i>Demographic & Structural Variables</i>				
Female	1=Female; 0=Male	51.6%		
African American	1=African American, non-Hispanic; 0=Other race/ethnic group	11.6%	10.7%	12.3%
Age	1=12 years... 10=21 years; 11=22 or 23 years; 12=24 or 25 years; 13=26-29 years; 14=30-34 years; 15=35-49 years; 16=50-64 years; 17=65 and older	13.4 (4.1)	13.3 (4.1)	13.5 (4.0)
Education	1=5th grade or less; 2=6th grade... 9=Freshman/13th year; 10=Sophomore/14th year or junior/15th year; 11=Senior/16th year or higher	8.2 (2.5)	8.2 (2.6)	8.2 (2.5)
Married	1=Married; 0=divorced, widowed, separated, or never married	50.8%	52.7%	49.0%
Children at home	1=Respondent's children <18 in household; 0=No children of respondent <18 in HH	29.6%	26.6%	32.3%
Work Force	1=Participating in workforce; 0=Not working	63.5%	69.5%	58.0%
Individual income	1=Less than 10,000; 2=10-19,999; 3=20,000-29,999; 4=30,000-39,999; 5=40,000-49,999; 6=50,000-74,999; 7=75,000 or more	3.0 (2.0)	3.5 (2.1)	2.6 (1.8)
<i>Depression and Drug Use Variables</i>				
Lifetime Depression	1=Major depressive episode in lifetime; 0=No major depressive episode in lifetime	14.8%	9.6%	19.6%
Past Year Marijuana Use	1=Use; 0=No use	11.1%	13.7%	8.6%
Past Year Cocaine Use	1=Use; 0=No use	2.4%	3.3%	1.5%
Past Year Other Illicit Substance Use	1=Use; 0=No use	7.3%	8.2%	6.4%
Past Year Any Illicit Substance Use	1=Use; 0=No use	14.9%	17.6%	12.3%
Any drug use more than 12 months ago	1=Use; 0=No use	44.9%	49.8%	40.0%

Note: Standard deviations in parentheses.

STAGE ONE FINDINGS

We use logistic regression models to analyze these data and the results of this analysis are presented in Exhibit 2, which presents both unstandardized logistic coefficients and odds ratios (in parentheses). In this and subsequent Exhibits, the dependent variable is the dichotomous indicator of any self-reported crime, with those respondents reporting any drug sale, assault, or theft in the past 12 months coded as 1, and those not reporting crime coded as 0. Thus, the unstandardized coefficients and odds ratios represent the likelihood of committing a crime in the 12 months preceding the interview.

Demographic and Structural Variables. Before adding the key variables for drug use and depression, the effect of the demographic variables was examined. As the first row in Exhibit 2 demonstrates, the female coefficient is significantly negative in all models. The odds ratio for “female” in Model 1 gives a better idea of what these coefficients represent. A significant odds ratios with a value below 1 indicates that the independent variable reduces the odds of the dependent variable having a value of 1 (crime), and an odds ratio greater than 1 indicates an increase in these odds. Subtracting 1 from the ratio and multiplying by 100 gives the percent change in the odds of the dependent variable having a value of 1. Thus, the odds for females (.45 in Model 1 of Exhibit 2) indicates that, compared to males, being female is associated with a 55 percent decrease in the odds of crime.

Exhibit 2. Logistic Regression Models Predicting Any Crime in Past 12 Months

Variable	Model 1	Model 2	Model 3	Model 4
<i>Demographic & Structural Variables</i>				
Female	-.80** (.45)	-.73** (.48)	-.70** (.50)	-.79** (.45)
African American	.47** (1.60)	.56** (1.75)	.56** (1.75)	.61** (1.84)
Age	.45** (1.57)	.22** (1.25)	.19** (1.21)	.20** (1.22)
Age-squared	-.03** (.97)	-.02** (.98)	-.02** (.98)	-.02** (.98)
Education	-.06** (.94)	-.07** (.93)	-.08** (.92)	-.08** (.92)
Married	-.85** (.43)	-.58** (.56)	-.54** (.58)	-.48** (.62)
Children at home	.20* (1.22)	.27** (1.31)	.20* (1.22)	.20* (1.22)
Work Force	-.20** (.82)	-.21** (.81)	-.25** (.78)	-.24** (.79)
Individual income	-.16** (.85)	-.15** (.86)	-.16** (.85)	-.15** (.86)
<i>Depression and Drug Use Variables</i>				
Drug use past 12 months		1.91** (6.75)	1.66** (5.26)	1.66** (5.26)
Drug use more than 12 months ago			.64** (1.90)	.58** (1.79)
Lifetime depression				.55** (1.73)
Constant	-2.44	-2.44	-2.39	-2.43
Number of Cases	36,899	36,899	34,870	34,532
-2 Log Likelihood	10649.6**	9616.3**	9023.8**	8873.4**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01

As Exhibit 2, Model 1 reveals, being African American has a positive effect on crime, consistent with previous studies. Our models include both age and its square to model an expected curvilinear effect of age: respondents increase their rates of offending as they age into the highest offending ages (late teens/early 20s), but as they start to age beyond the mid-20s, their rates of crime decline. Indeed, this is what we find: the main effect of age is significantly

positive, and age-squared (capturing the crime-reducing impact of age as respondents mature) is significantly negative. Education has a negative relationship with crime, suggesting that each additional unit of education decreases one's likelihood of committing crime.

Examining marriage and children in Model 1, we see that being married lowers an individual's likelihood of committing all types of crimes, while having children at home increases the odds of engaging in crime. This analysis also reveals that participating in the workforce has negative impact on crime. Income has also has a negative impact on self-reported criminal activity. Overall, our analysis of demographic and social structural variables tend to agree with previous research suggesting that individuals who have social bonds to family, education, employment, and additional income tend to engage in less crime than those who lack these social bonds. These variables are important controls throughout the analyses, but hereafter we focus on our key measures of drug use and depression.

Depression and Drug Use. Models 2, 3, and 4 of Exhibit 2 add the key independent variables of depression and drug use. Even after these variables are added to the analysis, the demographic and structural controls are consistent in strength and direction. Model 2 adds drug use in the past twelve months. This measure includes the use of any illegal drugs; we find an especially strong effect of recent drug use on crime, with respondents who used drugs 575 percent ($6.75 - 1 \times 100 = 575$) more likely to engage in crime than those who did not use drugs. This effect is slightly smaller (but still quite large) in Model 3, which controls for a history of drug use (greater than 12 months ago). The inclusion of a dummy for drug use more than 12 months ago serves to control for individual propensity for deviant behavior. This corrects for bias in parameter estimates due to the omission of unmeasured, stable characteristics of

individuals (Kessler and Greenberg 1981; De Coster 2005). Controlling for deviant propensity, we still find an especially strong effect of current drug use on self-reported crime.

Keeping these controls for drug use (both current and historically), we find strong evidence of a positive relationship between a major depressive episode and self-reported crime (see Model 4). Respondents who have a history of depression (at any point in the respondent's lifetime) are 73 percent more likely to engage in criminal activity than respondents who have no history of depression. We explore these drug use and depression effects in greater detail—by examining gender differences—in the following exhibits.

Gendered Effects of Drug Use and Depression on Crime

We further examine the gendered effects of the independent variables on crime by modeling separate regressions of female and male sub-samples (in Exhibit 3 and subsequent Exhibits). For every independent variable, we conducted a z-test to formally test whether the effect of the coefficient is significantly different for male and female respondents. Statistically significant gender differences are shaded in our exhibits.

The first two columns of Exhibit 3 demonstrate that male and female respondents appear similar in terms of the effects of race, age, marriage, employment, income, and past drug use on crime. There are statistically significant differences, however, in the impacts of educational attainment, children, depression, and recent drug use. Compared to men, educational attainment has a significantly different effect on women. Each additional increment of education for women reduces the odds of self-reported crime by 16 percent, whereas the effect of educational attainment is not significant for men. The effect of children is significant only for men, with male respondents who have children significantly more likely to engage in crime; children have little impact on women's crime. Depression also presents a gendered impact: generally depression

increases both men's and women's rates of criminal activity, but this effect is particularly strong for women. Men who are depressed increase their odds of crime by 49 percent whereas women who are depressed increase their odds of criminal activity by over 116 percent. Recent drug use similarly has a particularly large effect on women's crime, although it also raises the odds of crime by men.

Exhibit 3. Logistic Regression Models Predicting Any Self-Reported Crime or Arrest in the Past 12 Months

Variable	Any Self-Reported Crime		Any Arrest	
	Women	Men	Women	Men
<i>Demographic & Structural Variables</i>				
African American	.70** (2.01)	.59** (1.80)	.26 (1.30)	.46** (1.58)
Age	.22** (1.25)	.19** (1.21)	.72** (2.05)	.49** (1.63)
Age-squared	-.02** (.98)	-.02** (.98)	-.04** (.96)	-.02** (.98)
Education	-.17** (.84)	-.03 (.97)	-.23** (.79)	-.17** (.84)
Married	-.53** (.59)	-.46** (.63)	-1.09** (.34)	-.96** (.38)
Respondent Kids in HH	-.01 (.99)	.35** (1.42)	.90** (2.46)	.18 (1.20)
Work force	-.16 (.85)	-.27** (.76)	-.85** (.43)	.18 (1.20)
Individual income	-.20** (.82)	-.14** (.87)	-.15* (.86)	-.27** (.76)
<i>Depression and Drug Use Variables</i>				
Lifetime depression	.77** (2.16)	.40** (1.49)	.01 (1.01)	.09 (1.09)
Drug use past 12 months	1.89** (6.62)	1.54** (4.66)	2.02** (7.54)	.93** (2.54)
Drug use more than 12 months ago	.39* (1.48)	.71** (2.03)	.51* (1.67)	1.38** (3.97)
Constant	-3.00	-2.61	-5.88	-4.66
Number of Cases	17,698	16,834	17,473	16,410
-2 Log Likelihood	3415.8**	5411.6**	1866.393**	4250.612**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01 Shaded cells indicate statistically significant gender differences using z-tests.

Depression, Drug Use, and Any Arrest

In addition to our analysis of the predictors of self-reported crime, we also considered the gendered effect of depression and drug use on arrests. Most of our analyses concentrated on self-reported behavior because using arrests as the outcome of interest has serious limitations, including concerns that it represents offenders who were *caught*, not necessarily an accurate indication of actual criminal behavior. Using arrests as an outcome is perhaps a better indicator of the behavior of police than a strict measure of the criminal propensity of offenders. Nevertheless, because the NSDUH asked more detailed questions about arrest than it did about self-reported criminal behavior, we also considered arrests as an outcome for supplemental analyses. The NSDUH inquired about past year arrest for violent offenses (including rape, murder, robbery, assault, and aggravated assault), property offenses (motor vehicle theft, arson, burglary, larceny/theft, and fraud/stolen goods), drug sales, and “other” offenses (including prostitution, weapons possession, DUI, and sex offenses not including rape or prostitution). We consider each of these types of arrests as dependent variables, in addition to a measure of any arrest in the past year.

Our analysis of gender differences in arrest is presented in the last two columns of Exhibit 3. Compared to the self-reported crime analysis in the first two columns, we find a few differences, including educational attainment, which does not have a gendered effect in this analysis, and age-squared, which does have a gendered age effect, particularly decreasing the odds of arrest for women.

Examining the key variables of depression and drug use, we find that lifetime depression does not have a gendered effect in this model, nor is it statistically significant for either males or females, as it was for self-reported crime. This suggests that, although depression appears to

have a significant effect on criminal behavior—particularly for women—it does not appear to affect the likelihood of the respondent being arrested. Past and recent drug use does present a gendered impact: generally drug use increases the odds of arrest for both males and females, but the effect for recent use is particularly strong for females, and past use is particularly strong for males. This historical use was not significantly different for men and women in the self-reported crime analysis.

Females who used drugs more than 12 months ago increase their odds of arrest by 66 percent whereas males who used more than 12 months ago increase their odds of arrest by approximately 297 percent. Recent drug use has a particularly large effect on women’s arrest, although it also raises the odds of arrest by men.

Drug-Specific Analyses

Three categories of illicit substances were individually examined to determine their differential impact on crime: marijuana, cocaine, and other illicit substances; we also control for historical use of any illegal substance (and consequently an approximation of deviant propensity) in these analyses. Overall, past year use of each of the illegal substances has a strong positive effect on crime, as can be seen in the first two columns of Exhibit 4. In most cases, the effect of these substances on men and women is very similar.

Exhibit 4. Logistic Regression Models Predicting Any Crime in Past 12 Months

Variable	Any Self-Reported Crime		Any Arrest	
	Women	Men	Women	Men
<i>Demographic & Structural Variables</i>				
African American	.84** (2.32)	.76** (2.14)	.36* (1.43)	.59** (1.80)
Age	.16* (1.17)	.14* (1.15)	.63** (1.88)	.46** (1.58)
Age-squared	-.01** (.99)	-.02** (.98)	-.03** (.97)	-.02** (.98)
Education	-.17** (.84)	-.03 (.97)	-.23** (.79)	-.17** (.84)
Married	-.46** (.63)	-.38** (.68)	-1.03** (.36)	-.95** (.39)
Respondent Kids in HH	.09 (1.09)	.40** (1.49)	1.11** (3.03)	.19 (1.21)
Work force	-.09 (.91)	-.27** (.76)	-.76** (.47)	-.20 (.82)
Individual income	-.19** (.83)	-.14** (.87)	-.12 (.89)	-.27** (.76)
<i>Depression and Drug Use Variables</i>				
Lifetime depression	.74** (2.10)	.41** (1.51)	-.05 (.95)	.07 (1.07)
Marijuana use past 12 months	1.14** (3.13)	1.13** (3.10)	1.42** (4.14)	.41** (1.51)
Cocaine use past 12 months	.84** (2.32)	.88** (2.41)	.87** (2.39)	.77** (2.16)
Any other illicit drug use past 12 months	1.14** (3.13)	.89** (2.44)	.90** (2.46)	.48** (1.62)
Drug use more than 12 months ago	.55** (1.73)	.71** (2.03)	.63** (1.88)	1.49** (4.44)
Constant	-2.88	-2.46	-5.58	-4.57
Number of Cases	17,698	16,834	17,473	16,410
-2 Log Likelihood	3347.2**	5226.8**	1821.69**	4222.47**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01
Shaded cells indicate statistically significant gender differences using z-tests.

The first two columns of Exhibit 4 demonstrate that use of marijuana appears to exert the strongest effect on criminal activity—for both men and women. All illegal substances, however, strongly increase the odds of criminal activity, despite our inclusion of a control for previous deviant activity—drug use more than 12 months ago. By adding this measure of prior use we still find that recent use has the largest impact on crime. Again, despite multiple controls for various

types of drug use, we still find statistically significant gender differences in the impact on depression on criminal activity. Women who are depressed are significantly more likely to engage in crime than are depressed men.

Depression, Types of Drug Use, and Any Arrest

We again conducted supplementary analyses where we examined the effect of social and economic factors, depression, and drug use on the dependent variable of arrest. We present these results in the final two columns of Exhibit 4. Compared to the first two columns, we find several differences. These differences include the impact of educational attainment, children, and being a part of the work force. Among our primary variables of interest, we find that depression has little effect on arrests, but past year marijuana use has a significant gendered effect. Females who used marijuana in the past 12 months increased their odds of arrest by over 313 percent. Men who used marijuana also had higher odds of arrest, but this only increases the odds of arrest by 51 percent. Drug use more than 12 months ago also has a significant gendered difference on arrest: it increases the odds of arrest for men and women, but much more so for males, increasing their odds of arrest by 344 percent.

Offense Specific Analyses

We were also curious about the impact of depression and drug use on various types of criminal activity. Therefore, we separated out our “any crime” models to focus on the three different types of self-reported criminal activity asked about in the NHDUH survey: drug sales, assault, and theft. These results are presented in Exhibit 5.

Exhibit 5. Logistic Regression Models Predicting Three Types of Crime in Past 12 Months

Variable	Drug Sales		Assault		Theft	
	Women	Men	Women	Men	Women	Men
<i>Depression and Drug Use Variables</i>						
Lifetime depression	.30 (1.35)	-.05 (.95)	1.13** (3.10)	.69** (1.99)	.57** (1.77)	.20 (1.22)
Drug use in past 12 months	2.33** (10.28)	2.28** (9.78)	1.76** (5.81)	.78** (2.18)	1.51** (4.53)	1.32** (3.74)
Drug use more than 12 months ago	.80** (2.23)	.68** (1.97)	.12 (1.13)	.66** (1.93)	.60* (1.82)	.61** (1.84)
Constant	-5.86	-5.20	-2.86	-3.04	-4.64	-3.23
Number of Cases	17,681	16,798	17,688	16,824	17,684	16,819
-2 Log Likelihood	1521.4**	3076.4**	2292.3**	3379.5**	1276.8**	2235.7**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01

Shaded cells indicate statistically significant gender differences using z-tests.

Models also control for African American, age, age², married, children, workforce, education, married, and individual income.

In Exhibit 5 we find gender differences in the predictors for the various offense types. In the interest of parsimony, we only present the key independent variables, and list the controls we included in each model at the bottom of the Exhibit. The positive relationship between depression and crime is larger for women, compared to men, and this is particularly true for assault. The odds of committing assault for depressed women is more than three times as high as the odds for women who are not depressed, while depression increases men’s odds of committing an assault by only 99 percent. However, for the other offense types (drug sales and theft), although the depression coefficient is larger for women and suggestive of a greater impact on women, we fail to find that depression raises women’s drug sale and theft rates significantly more than it raises men’s.

The use of any illegal drug (including marijuana, cocaine, heroin, and other illicit substances) during the past year has a very strong positive effect on all types of crime, even when controlling for other factors such as historical drug use. The effect is similar on men and women for drug sales and theft, but the impact of past year drug use is stronger on women’s

assault than on men's assault. The odds of committing assault for women who have recently used illicit substances are nearly 6 times the odds for other women, while the odds for men who have recently used are only 118 percent higher than the odds for other men. Our analysis points to a complex gendered relationship between assault and drug use: the effect of recent use on assault is stronger for women, although the effect of drug use more than 12 months ago is stronger for men.

Depression, Drugs, and Arrest Types

We also examined the key independent variables and gender differences in their impact on the four arrest types available in this dataset. These models are presented in Exhibit 6. Our dependent variables for this exhibit include: arrests for past year violent crime (rape, murder, robbery, assault, and aggravated assault), property crime (arson, burglary, larceny, motor vehicle theft, and fraud or stolen goods), drug sales (including possession, manufacture, or sale of drugs), and other crimes (driving under the influence of alcohol or drugs, drunkenness, possession of tobacco, prostitution, and other sex offenses not including rape or prostitution). Generally, we note little impact of depression on arrest types, but we do find a statistically significant gender difference in the effect of depression on other crimes: depression does not seem to increase the odds of arrest for "other" crimes for women, but it does for men.

Exhibit 6 also demonstrates that there are statistically significant gender differences in the effects of current (past 12 months) and past (more than 12 months ago) illicit drug use on violent arrests. Females who used drugs within the past 12 months have especially high odds of being arrested for violent crime when compared to males. Historical drug use, however, has the opposite effect on women. Drug use more than 12 months ago results in females lowering their

odds of arrest for a violent crime by 87 percent, but for males, it increases their odds of arrest for violence by 610 percent.

Exhibit 6. Logistic Regression Models Predicting Four Types of Arrest in Past 12 Months

Variable	Violent Arrest		Property Arrest		Drug Sale Arrest		Other Crime Arrest	
	Women	Men	Women	Men	Women	Men	Women	Men
<i>Depression and Drug Use Variables</i>								
Lifetime depression	.05 (1.05)	.29 (1.34)	.17 (1.19)	.04 (1.04)	.43 (1.54)	-.27 (.76)	-.25 (.78)	.35* (1.42)
Drug use in past 12 months	3.84** (46.53)	.24 (1.27)	1.09** (2.97)	.56** (1.75)	2.41** (11.13)	2.60** (13.46)	2.25** (9.49)	.95** (2.59)
Drug use more than 12 months ago	-2.04** (.13)	1.96** (7.10)	1.71** (5.53)	1.78** (5.93)	3.38* (29.37)	.91 (2.48)	1.11* (3.03)	1.15** (3.16)
Constant	-5.97	-5.57	-5.71	-4.49	-10.83	-8.41	-7.32	-5.81
Number of cases	17,474	16,411	17,475	16,410	17,474	16,411	17,475	16,412
-2 Log-Likelihood	738.6**	1523.5**	753.1**	1532.9**	367.8**	1092.9**	776.1**	2556.9**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01

Shaded cells indicate statistically significant gender differences using z-tests.

Models also control for African American, age, age², married, children, workforce, education, married, and individual income.

We believe that these significant gender differences in the impact of historical drug use may be at least partially explained by internalizing versus externalizing socialization of men and women. Because these models are also controlling for current substance use, the impact of the historical drug use variable is essentially an indicator of propensity for deviance, and the respondent's degree of entrenchment in drug use. Thus, the violent crime analysis suggests that the stress of long-term substance use and addiction is unlikely to increase women's rates of violence (or at least their rates of arrest for violence), but it does for men. Instead, women may direct this stress of long-term drug use inwardly—as women tend to be socialized to do; men, however, tend to be socialized to direct this stress outwardly, and to act violently (or at least be arrested for this violence).

Two-Stage Least Squares Regression Analysis

Thus far, this report has assumed that the mental illness indicators of depression and substance abuse are modeled appropriately as occurring prior to the dependent variable of crime.⁴ We further worked to model this assumption by using past year crime as our dependent variable, and lifetime depression and a measure of drug use greater than twelve months ago as our key independent variables. This was done to approximate correct temporal ordering to the extent possible using this cross-sectional dataset.

Nevertheless, there may still be concerns about the correct ordering of the mental illness and crime relationship, so we also examined the ordering of the drug use and criminal activity for men and women. Thus, we estimated two-stage least-squares (2SLS) models to shed light on the question of whether (a) drug use causes crime or (b) crime causes mental illness (see Hagan 1997; Hagan & Foster 2003). This analysis makes use of the data structure regarding the timing of drug use to approximate a longitudinal dataset, by creating “time 1” and “time 2” variables. “Time 1” variables consist of drug use behaviors reported to occur more than 12 months earlier whereas “time 2” behaviors have occurred within the past 12 months (as of the interview date).⁵ In these models, time 1 values of substance use are used as instrumental variables to define the reciprocal paths between drug use and crime. Using 2SLS, the reciprocal effects at time 2 can be estimated (see Kessler & Greenberg 1981), which represents the sum of the lagged and contemporaneous relationships between crime and drug use (see Hagan & Foster 2003). The coefficients from these reciprocal models (modeling for men and for women) therefore indicate the strength of the two relationships: drug use on crime and crime on mental illness.

Using 2SLS, we find evidence supportive of these relationships working in both directions. We find evidence of a reciprocal effect: illegal drug use significantly increasing the

likelihood of crime, and criminal behavior significantly increasing the likelihood of additional drug use.⁶ These relationships are apparent for both men and women, although the path leading from crime to drug use is larger for all respondents and is significantly larger for women than it is for men. Thus, we find evidence that these relationships are not unidirectional, but instead are reciprocal, with drug use increasing crime rates, and criminal activity increasing rates of drug use; this second path is particularly important for women. We analyze this effect of crime (and interaction with the criminal justice system) on drug use in stage three of this report.

Summary of Stage One Findings

Our evidence points to robustly positive effects of depression and drug use on criminal behavior. In general, being depressed and using illegal substances significantly increases the odds of crime, for both men and women. We believe that the negative affects associated with depression and drug use create strain that respondents seek to alleviate via criminal behavior. Depressed people may act out—especially via assault—in an attempt to deal with their negative emotions. Recent drug use especially increases criminal activity for women, and this is especially apparent for assault. We suspect that part of this gender difference is due to a saturation effect—the rate of assault is already considerably higher for men compared to women. Thus, each additional stressor, such as drug use, is not likely to raise the odds of male drug use much above their preexisting high level. Among women, however, their comparatively lower rates of aggressive behavior means that the additional stressor (via a “masculine” behavior like drug use) has potential to create previously unlikely assaultive behavior.

STAGE TWO FINDINGS

Because stage one demonstrates significant effects of depression and drug use on crime, it seems evident that an examination of the impact of substance abuse and mental health treatment on crime is warranted. We examine these topics in stage two. New variables used in this stage are presented in Exhibit 7. Because a diagnosis of drug dependency is more stringent, and is perhaps a necessity before expecting drug treatment, we alter our modeling of drug use in this stage. We now consider a dichotomous indicator of dependency on any illicit substance; this variable indicates which respondents meet the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) criteria for substance dependence (APA 1994). This was chosen because not all individuals who use an illegal substance are considered addicted and in need of treatment.

We also consider several measures of treatment in this stage. Because we wanted to maintain the correct temporal ordering to the extent possible using these data, we made several decisions regarding the correct variable to use. First, because treatment for drug dependency is likely to require a period of time before any results can reasonably be expected, we chose to use an indicator of drug treatment more than 12 months ago as our measure of substance treatment. This was particularly important because the dependent variable of interest refers to self-reported crime in the past 12 months. Therefore use of this measure ensures that any drug dependency treatment occurs prior to criminal activity. In contrast, our second decision had to do with treatment for depression. Although antidepressants typically require a brief adjustment period, they are generally expected to only be effective when an individual is actively taking them. Thus, our measure of depression treatment refers to past year treatment. We similarly consider a measure of any treatment for depression (medication, therapy, or other) in the past year. We use

this second depression treatment measure less often, however, because our analyses demonstrate little significant effect of this variable on crime.

Exhibit 7. Descriptive Statistics (N =35,455 listwise deletion)

Variable	Description	Weighted Mean/Percent
Drug dependency	1=High dependence on any one of nine drug types (marijuana, cocaine, heroin, hallucinogen, inhalant, prescription pain killer, tranquilizer, stimulant, sedative); 0=No dependence on any of the above substances.	16.0%
Drug treatment greater than 12 months ago	1=Any form of treatment for substance dependence; 0=No treatment	3.0%
Depression Rx last yr	1=Antidepressant treatment; 0=No treatment	4.0%
Depression treatment last year	1=Any form of treatment for depression; 0=No treatment	6.0%

Note: Standard deviations in parentheses.

Exhibit 8 demonstrates significant gender differences in the effect of depression and self-medication for depression (our depression × dependence scale measure) on self-reported criminal behavior. Depression generally increases crime (as was reported in stage one), and it especially increases criminal behavior for women. Respondents who are depressed and who also meet the DSM criteria for substance dependence (what we term “self-medicating”) actually appear to mediate the effects of their strain and generally have lower rates of crime; this is especially true for women. We find no significant effects of depression or substance abuse treatment, however.

Exhibit 8. Logistic Regression Models Predicting Any Crime in Past 12 Months

Variable	Combined	Female	Male
<i>Depression and Drugs</i>			
Depression (lifetime)	.95** (2.59)	1.35** (3.86)	.52** (1.68)
Substance Dependence Scale	5.42** (225.88)	5.54** (254.68)	5.37** (214.86)
Depression × Dependence Scale	-1.99** (.14)	-2.79** (.06)	-.96 (.38)
<i>Criminal History</i>			
History of arrest	.87** (2.39)	1.22** (3.39)	.72** (2.05)
<i>Treatment</i>			
Depression treatment	.07 (1.07)	.05 (1.05)	.08 (1.08)
Drug treatment	.17 (1.19)	.19 (1.21)	.17 (1.19)
Constant	-3.13	-3.70	-3.26
Number of Cases	35,749	18,333	17,089
-2 Log Likelihood	8787.1**	3373.0**	5357.1**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01
 Shaded cells indicate significant difference between sexes using a z-test.
 Models also control for female (combined model only), African American, age, age², married, children, workforce, education, married, and individual income.

Because we find little effect of substance dependence and/or depression treatment on crime in Exhibit 8, we examine treatment in more detail in the subsequent exhibits. Exhibit 9 examines the interaction between age and treatment for substance dependency on crime.

Exhibit 9. Logistic Regression Models Predicting Any Crime in Past 12 Months

Variable	Combined	Female	Male
<i>Drugs and Treatment</i>			
Age × drug treatment > 12 mo. ago	-.08** (.92)	-.03 (.97)	-.10** (.90)
Drug treatment > 12 mo. ago	1.11** (3.03)	.52 (1.68)	1.36** (3.90)
Substance dependency	4.93** (138.38)	4.75** (115.58)	5.05** (156.02)
<i>Criminal History</i>			
History of arrest	1.05** (2.86)	1.34** (3.82)	.94** (2.56)
<i>Demographics</i>			
Age	-.15** (.86)	-.11** (.90)	-.18** (.84)
Constant	-2.209	-2.577	-2.382
Number of Cases	53,821	28,202	25,619
-2 Log Likelihood	13405.488**	5296.190**	8047.578**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01 Shaded cells indicate significant difference between sexes using a z-test.

Models also control for female (combined model only), African American, education, married, children at home, and individual income.

In Exhibit 9, we find no significant gender differences in the effect of treatment, but we do find a significant age effect of treatment. Older respondents who received drug treatment have significantly lower odds of self-reported crime. Among younger respondents, however, the effect of drug treatment appears to be positive, suggesting that these respondents are perhaps not mature enough to benefit from treatment.⁷ This finding suggests that a one-size-fits-all drug treatment model may not be meeting the needs of youth. Finally, the substance dependency variable indicates that respondents with substance dependency who have not experienced treatment have much greater odds of crime.⁸

Exhibit 10 examines depression and treatment for depression in greater detail. From our age × depression medication interaction, we find that older respondents who take antidepressants

have significantly reduced odds of crime. The main effect of depression medication indicates that younger respondents who take antidepressants are more likely to engage in crime.

Exhibit 10. Logistic Regression Models Predicting Any Crime in Past 12 Months

Variable	Combined	Female	Male
<i>Depression and Treatment</i>			
Age × depression medication	-.08** (.92)	-.08** (.92)	-.08* (.92)
Depression medication	.95** (2.59)	.99** (2.69)	.87** (2.39)
Lifetime depression	.85** (2.34)	1.00** (2.72)	.70** (2.01)
<i>Demographics</i>			
Age	.38** (1.46)	.39** (1.48)	.38** (1.46)
Constant	-2.71	-3.25	-2.63
Number of Cases	36,436	18,742	17,694
-2 Log Likelihood	19828.3**	7944.0**	11839.7**

Note: Unstandardized logistic coefficients with odds ratios in parentheses. * p < .05 ** p < .01 Shaded cells indicate significant difference between sexes using a z-test. Models also control for age², female (combined model only), African American, education, married, children, arrest history, and individual income.

In Exhibit 10, the effect of lifetime depression indicates that depressed respondents who do not receive treatment (in the form of antidepressants) are significantly more likely to engage in crime, and this is particularly true for women. This suggests that depression treatment (at the least, antidepressant medication) is important for reducing crime rates, but this is particularly true for older respondents;⁹ and among those who do not receive treatment, women are particularly burdened and appear to experience the highest levels of strain, leading to especially high rates of crime.