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# THE RELATIONSHIP BETWEEN MENTAL HEALTH PROBLEMS AND VIOLENCE AMONG CRIMINAL OFFENDERS

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A major challenge in studying the relationship between mental disorder and violent behavior lies in eliminating spuriousness from the analysis because the two share many of the same risk factors. This study uses nationally representative data from the Survey of Inmates in State and Federal Correctional Facilities 1997 ( $N = 17,248$ ) in an attempt to isolate causal effects of mental health problems on violent behavior among criminal offenders. Controlling for respondents' past violent behavior and other relevant factors, the research found that a history of mental health treatment is more strongly associated with assaultive violence and sexual offenses than with other types of crimes. In addition, there is support for a deviance hypothesis: Offenders with mental health problems tend to engage in more deviant types of criminal acts than those without such problems.

**Keywords:** *criminal offenders; mental disorders; violence; sex offenses; crime*

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For decades, researchers have studied the relationship between mental health problems and violent behavior (for reviews, see Arboleda-Flórez, Holley, & Crisanti, 1998; Link & Stueve, 1995; Monahan, 1992, 2002; Mulvey, 1994; Silver, 2006; Wessely & Taylor, 1991). Studies conducted prior to the 1980s suggested that mental illness was not associated with violence (for reviews, see Link, Andrews, & Cullen, 1992; Monahan & Steadman, 1983). Studies conducted since then suggest a different conclusion (Link et al., 1992; Link & Stueve, 1995; Monahan, 1992; Mulvey, 1994; Silver, 2006). Specifically, the most recent work in this area suggests that although most people with mental health problems do not engage in violence, the likelihood of committing violence is greater for people with mental health problems than for those without.

Researchers are, of course, interested in whether mental illness has a causal effect on violence. The main problem in studying the relationship between mental illness and violence is the strong possibility that the relationship is spurious (Hiday, 2006; Link et al., 1992; Monahan & Steadman, 1983; Silver & Teasdale, 2005). Many of the life circumstances and experiences that affect the likelihood of violence also affect the likelihood of mental illness. Research shows that mental illness and violence share many of the same risk factors, including gender, age, race/ethnicity, individual and neighborhood socioeconomic status (SES), physical and sexual abuse, stressful life events, impaired social support, and substance abuse

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(Aneshensel, 1992; Hiday, 2006; Monahan et al., 2001; Silver, 2000, 2006; Silver & Teasdale, 2005; Swanson, 1993; Swanson, Holzer, Ganju, & Tsutomu, 1990). Although individual studies have taken into account some of these control variables, no study has taken into account all or most of them. In addition, there are probably other common causes that are not yet known. Thus, the possibility remains that the association between mental illness and violence that has been reported in prior studies is spurious, not causal.

To address this issue, the current study used a retrospective longitudinal design. In our primary analyses we examined whether inmates formerly treated for mental health problems are more likely to have been convicted of homicides and assaults than other types of crimes for their most recent offense. These are the types of violent offenses typically associated with mental illness. To isolate the effect of mental health problems on current violence, we controlled for prior convictions for violent offenses. Controlling for prior violent behavior removes from the analysis variation that is caused by a wide range of factors related to violent behavior. To the extent that these factors are also related to mental health problems, controlling for prior violence goes a long way toward eliminating spuriousness from the model.

We controlled for a variety of other potentially confounding factors, including gender, age, race, SES, prior victimization, and alcohol use and drug use (both chronic and during the time of the offense). Alcohol use and drug use are particularly important control variables because of their strong association with both violence and mental illness (Steadman et al., 1998; Swanson, 1993; Tiihonen, Isohanni, Räsänen, Koiranen, & Moring, 1997). Furthermore, these studies have found that the association between mental illness and violence is often reduced or eliminated when alcohol use and drug use are taken into account. Violent victimization is also an important control variable, as several studies have found that it is associated with both mental disorder and violence (Hiday, Swanson, Swartz, Borum, & Wagner, 2001; Hiday, Swartz, Swanson, Borum, & Wagner, 1999; Silver, 2002; Silver, Arseneault, Langley, Caspi, & Moffitt, 2005; Teplin, McClelland, Abram, & Weiner, 2005; Walsh et al., 2003).

#### THE DEVIANCE HYPOTHESIS

We also examined the types of violent crime committed by inmates with mental health problems, hypothesizing that inmates with mental health problems commit violent crimes that are more deviant or anti-normative than those committed by inmates without mental health problems. According to what we shall call the deviance hypothesis, offenders with mental health problems are more likely to engage in violent behavior that is either unusual or particularly serious, or both. The hypothesis follows from the idea that disordered thinking is more likely to be involved when individuals engage in behaviors for which moral inhibitions are strongest and punishments most severe. On the other hand, mental illness is not as likely to be a factor in "ordinary crime." For example, one would expect that mental illness is more likely to be involved when a mother kills her child than when a man kills another man in a fight. At the other extreme, one would not expect mental illness to be involved in marijuana smoking among young people.

The deviance hypothesis also follows from the augmentation principle in attribution theory (e.g., Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003; Heider, 1958; Jones & McGillis, 1976). According to the augmentation principle, when a behavior occurs despite strong inhibiting external forces, observers tend to assume that a strong internal force is

responsible (Kelley, 1973). For example, the heavier an object lifted (the inhibiting external force), the more physical strength (internal force) one attributes to the lifter. Similarly, the more anti-normative the behavior—the stronger the external force operating against it—the more likely it must be caused by some internal force like mental illness. Thus, common sense leads to the exaggerated statement that a person who commits a particularly heinous act must have been “crazy.” Note that although attribution theory deals with perceptions, the theory assumes that these perceptions are valid to some extent. It treats observers as “naïve psychologists,” lay scientists making internal and external causal attributions.

The deviance hypothesis would predict that mental illness plays a more important role in homicide than physical assault. The deviance hypothesis also implies that mental illness plays a more important role in sexual offenses than physical assault. Sexual offenses are less frequent and generally more serious than physical assaults, even though mental illness is more often associated with physical attacks in the public mind. Because gender and age are strong predictors of violent behavior, they also provide an opportunity to examine the deviance hypothesis. Thus, men who assault men should be less likely to be mentally ill than perpetrators of assaults involving other gender combinations, as violence between men is more frequent and thus less deviant. On the other hand, female offenders and offenders who assault women may be more likely to be mentally ill, because these offenses occur with lower frequency and are more socially disapproved of than incidents involving men (for reviews of the literature, see Felson, 2002; Robbins, Monahan, & Silver, 2003).

It is also predicted that mental illness plays a more important role in violence committed by older offenders, because violence is more normative among the young (U.S. Department of Justice, 2000). Finally, we examine the victim's age, as indicated by the offender's relationship to the victim. People who physically assault or kill their children are particularly likely to have mental health problems, based on the assumption that this type of violence is more anti-normative than assaults on other victims. Although corporal punishment of children is normative in American society (Straus, Gelles, & Steinmetz, 1980), the type of violence that results in incarceration in state and federal prison is not.

#### PRIOR RESEARCH

Numerous studies of the relationship between mental illness and violence have been conducted since 1990 (Arsenault, Moffitt, Caspi, Taylor, & Silva, 2000; Link et al., 1992; Link & Stueve, 1994; Link, Monahan, Stueve, & Cullen, 1999; Silver & Teasdale, 2005; Steadman et al., 1998; Stueve & Link, 1997; Swanson, 1993; Swanson et al., 1990; Swanson et al., 1996).<sup>1</sup> All but one of these studies (Steadman et al., 1998) reported a significant association between mental illness and violence after controlling for variables, including age, gender, SES, marital status, stressful life events, impaired social support, alcohol use and drug use, prior treatment in a psychiatric hospital, urban residence, neighborhood rates of violence, and social desirability.<sup>2</sup> Together, these studies support the conclusion that although most mentally ill people do not engage in violence, mental illness does raise the risk of violence, particularly when it involves substance abuse or paranoid delusions (for reviews, see Arboleda-Flórez et al., 1998; Hiday, 2006; Link & Stueve, 1995; Monahan, 1992, 2002; Mulvey, 1994; Silver, 2006; Wessely & Taylor, 1991).

None of the empirical studies mentioned above included a control for prior violent behavior. Two, however, included a control for prior misbehavior more generally. Swanson

(1993) controlled for prior arrests (as well as gender, age, SES, alcohol abuse, and history of psychiatric hospitalization) in a study based on a sample from the general population. He found that respondents who reported having a major mental illness in the past year (schizophrenia, major depression, or bipolar disorder) were more likely to have engaged in violence in the past year. Arseneault et al. (2000) controlled for childhood behavior problems (i.e., conduct disorder) in their analyses of data from a 21-year-old New Zealand birth cohort. They found that schizophrenia was associated with a higher rate of violence and that the relationship was reduced substantially when perceptions of threat were controlled. The analysis supports the idea that mental illness increases the likelihood of violence when it involves paranoid beliefs (Link et al., 1999; Link & Stueve, 1994; but see Appelbaum, Robbins, & Monahan, 2000). The relationship was also reduced substantially when childhood conduct disorder was controlled. This supports the idea that the relationship between mental illness and violence is in part spuriously related to prior levels of conduct disorder, indicating the importance of controlling for prior misbehavior in such analyses. It raises the question of whether the relationship between mental illness and violence would have disappeared completely if prior *violence* had been controlled. Our results will suggest that controlling for prior nonviolent criminal behavior is not sufficient.

Only one prior study examined whether acts of aggression committed by people with mental illness were more serious than those committed by people without mental illness. In that study, Steadman et al. (1998) compared the proportion of aggressive acts committed by people with mental illnesses that could be considered *serious*—that resulted in injury, involved a weapon, or involved forced sex—to a control group of people without mental illness. Thirty-six percent of the aggressive acts committed by people with mental illness in the first 10 weeks following their discharge from a psychiatric hospital were serious compared to 23% of the aggressive acts committed by people without mental illness. This difference disappeared after the first 10-week period. The finding that people with acute mental illness committed violence that was more serious than the control group provides partial support for the deviance hypothesis. Such persons may be more likely to end up in a prison sample, such as the one we are using (Markowitz, 2006).

In sum, prior research suggests that there is a causal relationship between mental illness and violence (although a single study casts doubt on this interpretation, suggesting that a relationship only exists in the context of substance abuse). None of the studies control for prior violence, however. In addition, all of the prior studies are based on either the general population or comparisons between mental patients and the general population. Their measures of violence are, therefore, dominated by minor acts of violence, because these are so much more frequent than serious violence. As a result, none of the studies conducted to date examine whether mental illness is associated with the commission of serious violence (i.e., homicide and aggravated assault).

By examining a sample of convicted offenders, the current study focused on these serious violent offenses. In addition, we controlled for past violence, substance abuse, and other relevant factors. We substantially reduced the possibility of reverse causality in our analyses by controlling for past violence while examining the association between mental health problems and recent violence. Finally, only one prior study examined whether mentally ill offenders were more likely to commit more deviant (i.e., serious) types of offenses. We tested the deviance hypothesis by examining the type of violent offense committed by people with and without mental health problems (homicide and sexual offenses versus

physical assault), the gender of the offender and victim, the age of the offender, and whether the victim was the offender's child.

## METHOD

### PARTICIPANTS

Data for this study come from the Survey of Inmates in State and Federal Correctional Facilities, 1997 (U.S. Department of Justice, 2000). The data were obtained from nationally representative samples of inmates from state and federal facilities. Both use the same survey instrument and a similar stratified sample design. Initially, 280 state and 40 federal prisons were selected, of which 5 state facilities were either closed or refused to participate. Within each facility, a sample of prisoners was drawn according to the facility's size, gender ratio, and in the case of federal prisons, the ratio of drug offenders. With some inmates unable and some unwilling to participate, the total response rate was 92%, leaving a final sample size of 18,326 cases. The survey used computer-assisted personal interviews to ask questions about personal characteristics, criminal history, conditions of the current offense, drug and alcohol use, and inmate health. After excluding cases without clearly categorized offenses and removing cases with missing data, the sample size for our main analysis was 17,248.

Given our research questions, studying a large and nationally representative sample of convicted offenders from state and federal prisons had several advantages. First, it allowed for an examination of the most serious types of violence. Analyses of the general population tend to focus mostly on minor acts of violence, as they occur so much more frequently than serious violence. Second, we were able to control by design for factors related to criminal behavior more generally. That is, because the sample consisted of convicted felons, we did not have to worry that results regarding mental health problems and violent crime were affected by variables that might produce a spurious relationship between mental disorder and crime generally.

Third, using an offender sample minimized "criminalization of the mentally ill" as an alternative explanation for our findings. Criminalization refers to the disproportionate involvement of people with mental illnesses in the criminal justice system (Engel & Silver, 2001; Lamb & Weinberger, 1998; Teplin, 1984). It poses a serious threat to the validity of studies that compare incarcerated violent offenders to the general population to ascertain the effect of mental illness on violent offending (Monahan & Steadman, 1983). In contrast, our study compared violent offenders and nonviolent offenders, all of whom were incarcerated within the criminal justice system. Therefore, any observed association between mental health problems and violent versus other types of offending could not be attributed to differences in the likelihood of entering the criminal justice system because of mental illness.

Although studying incarcerated felons is advantageous for isolating the effects of mental health problems on violence, it is disadvantageous with regard to generalizability. In other words, our study design enhanced internal validity at the expense of external validity or generalizability. The most serious threat to generalizability is probably the fact that many offenders avoid prosecution.<sup>3</sup> Also, because offenders who commit more serious crimes or who offend more frequently are more likely to be prosecuted and incarcerated, our sample

is likely to include more serious chronic offenders than a sample of the general population. In addition, if offenders with mental health problems are more likely to be apprehended because they are less careful in committing their crimes, then incarcerated offenders may be more likely to have mental health problems than offenders in the general population. The mentally ill will also be disproportionately incarcerated if the criminal justice system discriminates against them. On the other hand, a recent study of police–citizen encounters found that police are less likely to arrest suspects whom they believed had mental disorders (Engel & Silver, 2001). Thus, our sample of incarcerated offenders may underrepresent inmates with mental disorders. Given these countervailing influences, we cannot be certain that our results generalize to non-inmate populations. As a result, the conclusions we draw may be limited to individuals who have been arrested and convicted and whose lawbreaking behavior is serious enough to result in incarceration.

## MEASURES

*Offense type.* The dependent variable for the main analysis is the type of offense committed. The primary offense for which each inmate was imprisoned was used to construct five major offense categories: assaultive violence, sexual, property, drug, and other crimes. *Assaultive violence* includes homicide and physical assault, both of which typically stem from disputes. *Sexual offenses* include rape, sexual assault, statutory rape, and lewd acts with children. *Property crimes* include crimes of theft and illicit acquisition (e.g., armed robbery, auto theft, larceny, fraud). *Robbery* is both a violent and a property offense, so its classification is ambiguous. It is classified here as a property crime because it is typically financially motivated and a type of violent behavior not usually associated with mental illness. In addition, preliminary analyses confirmed that armed robbers and other property offenders have similar rates of mental illness. *Drug crimes* include possession or trafficking of controlled substances. Offenses that did not fall into one of these four categories were included as *other crimes*. These include offenses against the justice system (e.g., flight from prosecution, escape, and parole violation), serious traffic offenses, decency violations, and other crimes that could not be clearly categorized (e.g., involuntary manslaughter, kidnapping, and arson).

These five crime categories form the unordered categorical variable of offense type used in the multivariate analyses presented below. The topmost portion of Table 1 provides a breakdown of offenses. As shown, 16.3% of the sample committed acts of assaultive violence, 6.0% committed sexual offenses, 33.2% committed property crimes, 27.0% committed drug crimes, and 17.5% committed other crimes.

*Mental health problems.* Mental health problems were measured as one variable with three categories: serious mental health problems, minor mental health problems, and no mental health problems. Inmates were asked whether, because of a mental or emotional problem, they had ever (a) “been admitted to a mental hospital, unit, or treatment program where you stayed overnight?” (b) “taken a medication prescribed by a psychiatrist or other doctor?” (c) “received counseling or therapy from a trained professional?” and/or (d) “received any other mental health services?” Overnight admission to a hospital, unit, or program was taken as evidence of *serious mental health problems* prior to the offense. Those who reported no such overnight treatment but had received medication, counseling,

**TABLE 1: Descriptive Statistics (N = 17,248)**

Variable	M	SD	Range
<b>Crime</b>			
Assaultive violence	16.3%		
Sexual crime	6.0%		
Property crime	33.2%		
Drug crime	27.0%		
Other crime	17.5%		
<b>Mental health problems</b>			
Serious problems	10.1%		
Minor problems	18.1%		
No problems	71.8%		
<b>Prior offenses</b>			
Assaultive violence	0.15	0.49	0–5
Sexual crime	0.01	0.13	0–3
Property crime	0.67	1.11	0–5
Drug crime	0.28	0.68	0–5
Other crime	0.41	0.86	0–5
Victimization Scale	1.5	1.10	0–3
<b>Alcohol use</b>			
Less than weekly	14.7%		
More than weekly	22.1%		
Daily/almost daily	26.3%		
<b>Alcohol intoxication</b>			
Low	6.3%		
Medium	5.2%		
High	13.8%		
Drinking, intoxication unknown	5.6%		
Daily/almost-daily marijuana use	25.2%		
Marijuana use during offense	13.1%		
<b>Other drug use</b>			
Less than weekly	3.8%		
More than weekly	7.2%		
Daily/almost daily	26.2%		
Other drug use during offense	23.8%		
<b>Demographics</b>			
Male	79.3%		
Black	44.7%		
Hispanic	17.9%		
Other race	3.7%		
Age at arrest (years)	30.6	9.6	11–79
Education	10.9	2.6	0–18
Income	5.0	3.5	0–12
Income (missing)	3.7%		

or other services prior to the offense were coded as having a *minor mental health problem*. All other cases were coded as having *no mental health problem*.

The data set, unfortunately, does not include a measure of mental illness based on diagnostic categories and specific symptoms. We acknowledge that this is a limitation of our study. Although it is safe to assume that a very high proportion of people who receive mental health treatment (particularly overnight treatment) have mental health problems, many people who have mental health problems do not receive mental health treatment

(Robins & Regier, 1991). A substantial number of the inmates (28.2%) reported some involvement with treatment. However, studies based on reported symptoms find higher rates of mental illness in inmate samples. Note that we are most interested in inmates with more serious problems, and because these inmates are more likely to have received treatment, they are more likely to be coded correctly. However, it is clear that some individuals coded as not having mental health problems actually do. Men, minorities, and people with lower SES are particularly likely to be miscoded because they are particularly unlikely to receive mental health treatment (Robins & Regier, 1991). Controls for gender, race, and SES addressed this problem. For example, we controlled for the fact that men are less likely to receive treatment for mental health than women but are more likely to commit a violent offense (versus a property offense).

Still, there is clearly measurement error in this variable, and it is important to anticipate how it might affect our results. To the extent that we have random measurement error, our analysis constitutes a conservative test of the association between mental health problems and violence. But what if the observed effects reflect the effect of treatment as well as the effects of illness? Perhaps treatment reduces the likelihood of a violent offense versus a nonviolent offense. Offenders are not deterred from offending, but their offenses are less violent because of their treatment (Skeem, Monahan, & Mulvey, 2002). If this negative effect occurred, it would offset the predicted positive effect of mental illness. Again, it suggests that we have a conservative test. In fact, it is difficult to imagine any unmeasured variable that would *positively* affect both treatment and offense type, particularly when one controls for offense history.

Another way to address whether we are tapping effects of treatment or mental health problems is a survey question in which inmates were asked: "Do you have a mental or emotional condition? Yes or No." The problem with this question is that it asks about their current mental health status, not their mental health status at the time of the offense. In addition, only 9.8% of inmates reported that they suffer from a mental or emotional condition. Still, it will be useful to see if the results are similar when we substitute this measure. If the results are similar, it will strengthen the conclusion that our main measure of mental health is adequate. That is, if a positive relationship between mental health and violence is observed, using both measures, it is reasonable to assume that this reflects the effects of mental illness.

Table 1 provides a breakdown of the mental health problems variable. As shown, 10.1% of inmates had a serious mental health problem, 18.1% had a minor mental health problem, and 71.8% had no mental health problem in their lifetimes (as indicated by their treatment involvement). As expected, these rates are lower than those reported in a recent survey of inmates conducted by the Bureau of Justice Statistics, in which clinical diagnoses, treatment, and symptoms were measured (U.S. Department of Justice, 2006). In that survey, 45% to 56% of state and federal inmates were found to have mental health problems.

*Prior offenses.* Respondents were asked for the charges of each past offense for which they had been sentenced to incarceration or probation. Charges were categorized into the offense categories described above (assaultive violence, sexual, property, drug, and other crime) and summed into five indices of prior offenses, one for each offense category. Because very few (1.9%) inmates reported more than five offenses in any one category, counts of six or higher were recoded to five, forming scales from 0 to 5+. Table 1 provides descriptive statistics for the prior offense measures. As shown, prior property crimes were

reported most frequently, followed by other crimes, drug crimes, assaultive violence, and sexual offenses.

*Victimization.* Victimization was measured on a scale from 0 to 3. Respondents were asked whether they had “ever been shot at with a gun” (excluding military combat) and whether anyone had “ever used a knife or other sharp object” against them. An affirmative response to each question added 1 point to the Victimization Scale. Another question asked about physical abuse prior to prison. If no physical abuse was reported, a series of questions about physical attacks was asked: “Before you were admitted to prison, had anyone ever: Hit you with a fist? Beat you up? Choked you? Used a weapon, for example, a gun, knife, rock, or other object, against you?” An affirmative response to physical abuse or to any of these four questions added an additional point to the Victimization Scale (after eliminating double-counting for respondents who had been shot or stabbed and had, therefore, also had a weapon used against them). As shown in Table 1, the mean number of types of prior victimizations reported by inmates was 1.5.

*Alcohol use.* Alcohol use was measured in two ways: chronic use and use during the offense. Chronic alcohol use was measured from self-reports of drinking during the year prior to the offense and was coded into three dichotomous indicators of use: *daily or almost daily, at least once a week, or more than once a month*. The reference category includes those who did not drink or who drank less often than monthly.

Alcohol use during the offense was measured by estimating the degree of intoxication. Respondents were asked whether they had been drinking during the offense. If so, they were asked about quantities and types of alcohol and the duration of the drinking. Based on these measures, gender, and self-reported body weight, a blood alcohol concentration (BAC) measure was estimated. The BAC measure was collapsed into three dichotomous variables: BAC less than 0.1, indicating low-offense intoxication; BAC between 0.1 and 0.2, indicating medium-offense intoxication; and BAC greater than 0.2, indicating high-offense intoxication. Many respondents could not remember exactly what they had been drinking or for how long. Those who reported drinking during the offense, but for whom a BAC could not be calculated, comprise the fourth category of the BAC measure. The reference category for all four variables includes those who reported no or very minimal drinking during the offense. Descriptive statistics for the alcohol use variables are provided in Table 1.

*Drug use.* Drug use was measured in two ways: chronic use and use at the time of the offense. Respondents were asked about the frequency of use of 14 categories of illicit drugs, including inhalation of legal chemicals and use of regulated drugs without a prescription. Because of its high frequency of use in the sample, marijuana was measured separately from the other 13 drug categories as a dichotomous variable coded 1 for *daily or almost daily use* and 0 for *less frequent or no use*.

If respondents reported ever using a drug other than marijuana, they were asked for the frequency of use of that drug in the month before arrest. The highest reported frequency of all the drug types was taken and coded as three dichotomous variables: *daily or almost daily, at least weekly, or less than weekly*. The reference group includes those who did not report any drug use in the month prior to arrest.

Respondents' drug use during the offense was coded as a dichotomous variable in which 1 indicates that the inmate was under the influence of any drug and 0 indicates no drug use, excluding marijuana. Marijuana was again treated separately as a dichotomous variable coded 1 for *use during the offense* and 0 for *no use*. Descriptive statistics for the drug use variables are provided in Table 1.

*Demographic controls.* Demographic control measures include gender, age, race, education, and income. As indicated above, these are important controls considering their relationship to mental health treatment (Robins & Regier, 1991). Gender is a dichotomous variable coded 1 for *male* and 0 for *female*. For the main analysis, age at arrest is coded in years, calculated from the date of arrest and the respondent's date of birth. For the analysis examining the deviance hypothesis, in which we hypothesize that older assault offenders will exhibit more mental health problems than younger assault offenders, age is divided into four categories: *younger than 30*, *30 to 39*, *40 to 49*, and *50 and older*. The categories are treated as dummy variables with *younger than 30* as the reference category. Race is measured in three dichotomous variables: African American, Hispanic, and other races (primarily Asian and Native American), with a reference category of non-Hispanic White. Education is the highest grade of school attended and ranges from 0 to 18. Income is personal monthly income captured in a scale that ranges from 0 (*no income*) to 12 (*\$7,500 or more per month*). Missing values were imputed with the scale mean. An indicator variable was included for those cases for which income was imputed (3.7% of the sample).<sup>4</sup> As shown in Table 1, 79.3% of the sample was male, 44.7% was Black, and 17.9% was Hispanic, and the mean age was 30.6. The mean education was 10.9 years.

*Victim characteristics.* Measures concerning the victims of violent offenses were used to test the deviance hypothesis. Violent offenders were asked a series of questions about their victims. From these responses, variables were coded for gender of victim(s) and the relationship between offender and victim(s). Because some offenses were committed against multiple victims, two dichotomous variables were constructed for victim gender: one or more male victims (only) and both male and female victims, with a reference category of one or more female victims (only). An interaction between offender and victim gender was also measured as a dichotomous variable coded 1 for both male offenders and male victims and 0 if either offender or any victims were female.

The victim-offender relationship was measured with four variables, each coded 1 if one or more of the victims had a relationship to the offender. The relationships measured were romantic partner (spouse, ex-spouse, boyfriend, ex-boyfriend, girlfriend, or ex-girlfriend), own child (own child or stepchild), other family (parent, stepparent, sister, stepsister, brother, stepbrother, or other relative), and other known (friend, ex-friend, or other nonrelative well-known to the offender). As some offenses included victims in multiple categories (e.g., both a partner and child were victims), the relationship variables are not exclusive. The reference category for each of the four variables included offenders who did not have a relationship with any of their victims.

#### STATISTICAL PROCEDURE

In the main analysis, we examined whether offenders with mental health problems are more likely to have been convicted of assaultive violence than the four other offense

categories (sexual, property crime, drug crime, and other crime). We used a multinomial logistic regression procedure to do this analysis (Long, 1997). The multinomial procedure produces four separate equations, one for each category of the dependent variable compared to a reference category. For ease of interpretation, we used assaultive violence as the reference category and reversed the signs of the multinomial coefficients so that they indicate changes in the likelihood of engaging in assaultive violence, compared to each of the four crime categories (sexual, property crime, drug crime, and other crime, respectively).

In supplemental analyses examining the deviance of the offense, we treated mental health problems as the dependent variable, even though it was not considered a causal outcome. This design allowed us to examine the association of mental health problems with many different variables, and it did not affect the results. Treating mental health problems as an independent variable would have produced a long list of categories for the dependent variables. As in the main analysis, multinomial logistic regression was used to analyze the data, as the dependent variable—mental health problems—has three nominal categories (e.g., no mental health problems [the reference category], serious mental health problems, and minor mental health problems). In the supplemental analyses, however, we did not reverse the signs of the multinomial coefficients.

## RESULTS

Table 2 shows the distribution of offenses committed by inmates with different mental health statuses. Several things are noteworthy. First, acts of assaultive violence and sexual offenses appear to be more prevalent among inmates with mental health problems than among those without. For example, 21.5% of inmates with serious mental health problems committed acts of assaultive violence compared to only 14.5% of inmates with no mental health problems ( $t = 7.60, p < .001$ ). For sexual offenses, the corresponding percentages are 9.3% and 4.9% ( $t = 7.57, p < .001$ ). Those with minor mental health problems fall in between. There is little association between mental health problems and property offending, including armed robbery, and there is an inverse relationship between mental health problems and drug crimes. For example, 15.1% of inmates with serious mental health problems committed drug crimes, compared with 30.3% of inmates with no mental health problems ( $t = 13.19, p < .001$ ). This is likely because of the fact that a large proportion of inmates serving time in prison for drug crimes are involved in drug distribution, which, unlike drug use, is not a contributing factor to mental illness. Overall, Table 2 indicates that having mental health problems is associated with committing acts of assaultive violence and sexual offenses more so than with other types of crimes.

Does this association remain after controlling for prior offending, victimization, alcohol and drug use, and other relevant variables? The answer to this question is provided in Table 3, which presents the results of a multinomial logistic regression analysis in which assaultive violence (the reference category) is compared to other offense categories. As described above, the variables are coded so that a positive coefficient indicates that offenders with those characteristics are more likely to have committed assaultive violence.

The upper portion of the table shows the results for the mental disorder variables. Inmates with serious and minor mental health problems were significantly more likely to commit assaultive violence than property, drug, and other crimes. Inmates with serious and

**TABLE 2: Type of Offense by Mental Health Status**

	No Mental Problems (n = 12,381)	Minor Mental Problems (n = 3,121)	Serious Mental Problems (n = 1,746)	Total Sample (N = 17,248)
Assaultive violence	14.5%	20.7%	21.5%	16.3%
Sexual crime	4.9%	8.4%	9.3%	6.0%
Property crime	32.6%	33.0%	37.4%	33.1%
Drug crime	30.3%	20.5%	15.1%	27.0%
Other crime	17.6%	17.4%	16.6%	17.5%

**TABLE 3: Multinomial Logistic Regression Predicting the Likelihood of Assaultive Violence Compared to Other Crime Types**

	Likelihood of Committing Assaultive Violence Compared to Each of the Following:							
	Property Crime		Drug Crime		Other Crime		Sexual Crime	
	β	SE	β	SE	β	SE	β	SE
Intercept	0.04	.17	0.89	.18***	0.71	.19***	2.76	.30***
Serious mental health problems <sup>a</sup>	0.39	.08***	1.01	.09***	0.53	.09***	0.27	.11*
Minor mental health problems <sup>a</sup>	0.44	.06***	0.76	.07***	0.40	.07***	0.25	.09**
Male	0.26	.07***	0.70	.07***	0.19	.07*	-1.99	.19***
Black <sup>b</sup>	0.14	.06*	0.68	.06***	0.43	.06***	0.81	.09***
Hispanic <sup>b</sup>	0.24	.08**	0.85	.08***	0.05	.08	0.98	.13***
Other race <sup>b</sup>	0.48	.13***	0.01	.14	0.29	.14*	-0.02	.16
Age at arrest	0.01	.003***	0.04	.003***	0.04	.003***	-0.04	.004***
Education (years)	0.08	.01***	0.03	.01*	0.03	.01*	0.02	.01
Income category	0.003	.01	0.05	.01***	0.01	.01	0.01	.01
Income missing	0.10	.13	0.11	.13	0.07	.14	0.62	.25*
Prior assaultive violence	0.31	.05***	0.31	.06***	0.19	.05***	0.35	.09***
Prior sexual crime	0.43	.24	0.68	.30*	0.16	.23	-1.66	.21***
Prior property crime	0.43	.03***	0.05	.03	0.12	.03***	0.14	.05**
Prior drug crime	0.20	.05***	0.79	.05***	0.42	.06***	0.28	.11*
Prior other crime	0.004	.03	0.02	.04	0.28	.03***	0.01	.06
Past Victimization Scale	0.21	.02***	0.38	.03***	0.22	.03***	0.26	.04***
Alcohol use—less than weekly <sup>c</sup>	0.07	.08	0.03	.08	0.17	.09	0.22	.12
Alcohol use—more than weekly <sup>c</sup>	0.03	.07	0.11	.08	0.10	.08	0.18	.11
Alcohol use—daily <sup>c</sup>	0.06	.08	0.17	.08*	0.09	.09	0.12	.12
Low-offense intoxication <sup>d</sup>	0.80	.10***	0.69	.11***	0.12	.11	0.43	.17**
Medium-offense intoxication <sup>d</sup>	0.58	.11***	0.95	.12***	0.17	.12	0.17	.17
High-offense intoxication <sup>d</sup>	0.60	.08***	1.25	.09***	0.28	.09**	0.01	.12
Drinking, intoxication unknown <sup>d</sup>	0.81	.11***	1.01	.12***	0.31	.12**	-0.01	.15
Daily/almost daily marijuana use	0.28	.07***	0.33	.07***	0.01	.08	0.21	.12
Marijuana use during offense	0.11	.08	0.17	.09	0.01	.10	-0.37	.14**
Drug use—less than weekly <sup>e</sup>	0.46	.13***	0.86	.14***	0.28	.15	0.12	.23
Drug use—more than weekly <sup>e</sup>	0.32	.10**	0.70	.11***	0.01	.12	0.24	.18
Drug use—daily <sup>e</sup>	0.82	.09***	0.93	.10***	0.27	.10*	0.23	.16
Drug use during offense	0.17	.09*	0.40	.10***	0.14	.11	-0.09	.16

a. Compared to inmates with no prior mental health treatment.

b. Compared to non-Hispanic Whites.

c. Compared to inmates who drank less than monthly.

d. Compared to inmates not drinking during the offense.

e. Compared to inmates not using drugs during the offense.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

minor mental health problems were also significantly less likely to commit assaultive violence than sexual offenses. Together, these results suggest that, compared to property, drug, and other crimes, mental health problems are associated with assaultive violence and, to an even greater extent, with sexual offenses, controlling for a wide range of factors including prior assaultive violence and prior sexual offenses. These results are consistent with those reported in Table 2. Similar results were observed when sexual assault and rape were separated from the other sexual offenses.

We mention in passing some of the results associated with the control variables in Table 3: (a) Men were more likely to commit assaultive offenses, particularly sexual offenses; (b) Blacks and Hispanics were most likely to commit drug crimes and least likely to commit sexual offenses (but recall that robbery, a crime often committed by Black offenders, has been classified as a property crime); (c) younger offenders and offenders with a history of victimization were more likely to commit assaultive violence than other offenses; (d) less educated offenders were more likely to commit assaultive violence than property and drug crimes; (e) intoxicated offenders were more likely to commit assaultive violence than property and drug crimes; and finally, (f) chronic drug users, and those who were high on serious drugs at the time of the offense, were less likely to commit assaultive violence than property and drug crimes. For the purpose of this study, the important point is that offenders with mental health problems, controlling for all of these relevant factors, were more likely to commit assaultive violence and sexual offenses than other types of crime.

#### ALTERNATIVE MEASURES OF MENTAL HEALTH PROBLEMS

We discussed earlier our concern about the adequacy of a measure of mental health problems based on treatment. To address this concern, we substituted a self-report measure of *current* mental health for the treatment measure, and re-estimated the equations in Table 3. The top panel of Table 4 includes the coefficients for self-reported mental or emotional problems, leaving out the coefficients for the control variables. In general, the results are similar to our earlier results, although the effects are weaker. Inmates who report a mental or emotional condition—compared to those who do not—are more likely to commit assaultive violence than property crime, drug crime, and other crime. Current mental health condition is more strongly associated with sexual offenses than physical assault, but the difference is small and not statistically significant.

Our measure of mental health problems based on treatment is a lifetime measure, so it could include treatment that occurred after entering prison. Perhaps violent offenders are more likely to receive treatment in prison than other offenders; this could account for the positive relationship observed between violent offenses and mental health. In other words, it could be that type of offense affects treatment rather than that mental health affects type of offense. To address this issue, we created an alternative measure of the mental health problems variable. The survey included a question asking those inmates who had been treated for mental health problems in their lifetime if they had been treated since their incarceration. This measure was used to create a set of dummy variables: those who had been treated for mental health problems in prison (whether or not they had been treated before incarceration), those who had been treated for mental health problems in their lifetime but not in prison, and those who had never been treated (the reference category).

**TABLE 4: Multinomial Logistic Regressions Predicting the Likelihood of Assaultive Violence Compared to Other Crime Types, Using Alternate Measures<sup>a</sup>**

	<i>Likelihood of Committing Assaultive Violence Compared to Each of the Following:</i>							
	<i>Property Crime</i>		<i>Drug Crime</i>		<i>Other Crime</i>		<i>Sexual Crime</i>	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Self-report model								
Mental/emotional condition <sup>b</sup>	0.29	.08***	0.75	.09***	0.36	.09***	0.18	.11
Divided treatment model								
Treatment, in prison <sup>c</sup>	0.53	.06***	1.10	.07***	0.60	.07***	0.26	.09**
Treatment, not in prison <sup>c</sup>	0.22	.08**	0.40	.09***	0.16	.09	0.26	.12*

a. All control variables are included in the analyses but not shown.

b. Compared to inmates who reported no mental or emotional condition.

c. Compared to inmates with no mental health treatment.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

We re-ran the analysis in Table 3, substituting these dummy variables as the measure of mental health problems. We are mainly interested in the effects of lifetime treatment for those not treated in prison because those coefficients reflect the effects of mental health on type of offense, without including inmates who were treated after the offense. Note, however, that these coefficients should underestimate effects. The lifetime treatment category omits inmates who received treatment before as well as after incarceration, and this necessarily removes inmates with the most chronic forms of mental illness. The results, presented in the bottom panel of Table 4, are generally similar to the results in Table 3. Inmates who were treated only before incarceration were more likely than those never treated to commit assaultive violence compared to property or drug offenses, and they were slightly less likely to commit assaultive violence than sexual offenses. As expected, the coefficients for those treated in prison are stronger because they include many inmates who also were treated before incarceration and whose illnesses are most chronic.

#### THE DEVIANCE HYPOTHESIS

Recall that the deviance hypothesis states that offenders who commit less frequent and more serious types of violence are more likely to have mental health problems than those who commit more frequent and less serious types of violence. Thus, it was predicted that among assaultive violence offenders, homicide offenders were more likely to have mental health problems than offenders who commit physical assault. To test this hypothesis, we re-estimated the equation in Table 3, comparing homicide offenders to physical assault offenders. The results showed that offenders with mental health problems were more likely to commit homicide than physical assault and that the difference was statistically significant for minor mental health problems ( $b = 0.26$ ,  $p = .015$ ) but not for serious mental health problems ( $b = 0.14$ ,  $p = .280$ ; full model results available on request). The deviance hypothesis also predicts that sex offenders are more likely to have mental health problems than offenders who commit physical assault. Re-estimating the equation in Table 3, this time comparing the sex offenders to the physical assault offenders (and omitting homicide

offenders), we found the predicted effect. Offenders with mental health problems were significantly more likely to commit sexual offenses than physical assault ( $b = 0.41, p = .007$  for minor mental health problems;  $b = 0.45, p < .001$  for serious mental health problems; full model results available from the authors on request).

Next, we turn to the question of whether gender and age are associated with mental health problems. To address these issues, we limited the sample to those offenders who committed assaultive violence (including homicide and physical assault,  $n = 2,701$ ) and analyzed mental health problems as the dependent variable. Assaultive violence was chosen because the measures of victim characteristics are only available for violent offenses. Recall that this analytic strategy enabled us to examine simultaneously the association between mental health problems and a large number of factors. The equation included the offender's and victim's genders and an interaction term reflecting offenses in which both the offender and the victim are male. As shown in Table 5, for minor mental health problems we observed statistically significant effects for the offender's gender and the gender interaction term. The signs are in the predicted direction. A similar pattern was observed for serious mental health problems, although the coefficients were only marginally significant using a two-tailed test ( $p = .061$  for the main effect;  $p = .060$  for the interaction). Note that the effects are statistically significant if we use a one-tailed test. Given the consistency of the pattern for minor and serious mental illness, we think that we are detecting real effects.

We present the patterns associated with the interaction effect as percentages in Figure 1. The figure shows that men who assault or kill men are the least likely to have mental health problems, consistent with the deviance hypothesis. The main effect of the offender's gender also supports the deviance hypothesis: Female offenders are more likely than male offenders to have mental health problems. The table also suggests that female offenders who assault men are more likely than female offenders who assault women to have mental health problems. These differences are statistically significant using a one-tailed test ( $p = .067$  for serious mental health problems;  $p = .087$  for minor mental health problems).

The main effects of the offender's gender could also reflect the fact that women are more likely than men in general to experience and receive treatment for mental illness (e.g., Robins & Regier, 1991). To examine this possibility, we estimated a multinomial logistic regression equation using the assaultive violence and property offense cases only ( $n = 8,537$ ). The equation included an interaction term involving female offenders and assaultive violence.<sup>5</sup> A significant and positive interaction term would indicate that the association between female gender and mental health problems is stronger for assaultive offenses. This pattern would suggest that mental health problems play a stronger role in women's assaultive behavior than in men's. If the association between gender and mental health problems is no stronger for assaultive offenders (if the interaction term is insignificant), it suggests that the main effects of gender probably reflect gender differences in mental illness and treatment.

We found that the association between female status and major mental health problems was significantly larger for the violent offenders than for the property offenders ( $b = 0.41, p = .021$ ), suggesting that the higher rate of major mental health problems among female violent offenders is at least partly because of the greater effects of mental health problems on women's assaultive behavior. However, although the coefficient for minor mental health problems was in the predicted direction, it was not statistically significant ( $b = 0.23,$

**TABLE 5: Multinomial Logistic Regression Showing Associations With Mental Health Problems**

	<i>Minor Mental Problems<sup>a</sup></i>		<i>Serious Mental Problems<sup>a</sup></i>	
	$\beta$	SE	$\beta$	SE
Intercept	0.80	.35*	-1.60	.43**
Victim characteristics				
Male	0.36	.24	0.44	.30
Mixed gender	0.08	.21	0.31	.25
Male Victim $\times$ Male Offender	0.64	.29*	0.66	.35
Romantic partner	0.57	.18**	0.28	.22
Own child	0.23	.34	0.87	.34*
Family member	0.43	.25	0.70	.29*
Other known	0.26	.11*	0.13	.14
Offender characteristics				
Male	0.59	.22**	0.52	.28
Black <sup>b</sup>	0.68	.11***	-1.00	.14***
Hispanic <sup>b</sup>	0.94	.16***	-1.01	.20***
Other race <sup>b</sup>	0.49	.24*	0.42	.29
Age 30-39 <sup>c</sup>	0.20	.13	0.11	.15
Age 40-49 <sup>c</sup>	0.46	.19*	0.02	.20
Age 50 and older <sup>c</sup>	0.44	.35	0.58	.34
Education (years)	0.04	.02	0.03	.03
Income category	0.03	.02	0.04	.02
Income missing	0.15	.30	0.20	.32
Controls				
Prior assaultive violence	0.11	.09	0.35	.09***
Prior sexual crime	0.07	.42	0.15	.48
Prior property crime	0.01	.06	0.07	.07
Prior drug crime	0.12	.12	0.10	.14
Prior other crime	0.01	.07	0.11	.07
Past Victimization Scale	0.12	.05*	0.27	.07***
Alcohol use—less than weekly <sup>d</sup>	0.34	.15*	0.09	.20
Alcohol use—more than weekly <sup>d</sup>	0.01	.15	0.11	.19
Alcohol use—daily <sup>d</sup>	0.05	.16	0.42	.19*
Low-offense intoxication <sup>e</sup>	0.11	.20	0.34	.24
Medium-offense intoxication <sup>e</sup>	0.32	.22	0.59	.27*
High-offense intoxication <sup>e</sup>	0.03	.16	0.57	.19**
Drinking, intoxication unknown <sup>e</sup>	0.18	.20	0.56	.27*
Daily/almost daily marijuana use	0.01	.15	0.08	.18
Marijuana use during offense	0.36	.17*	0.06	.22
Drug use—less than weekly <sup>f</sup>	0.36	.27	0.48	.32
Drug use—more than weekly <sup>f</sup>	0.41	.21*	0.06	.27
Drug use—daily <sup>f</sup>	0.31	.19	0.24	.23
Drug use during offense	0.11	.19	0.51	.23*

a. Compared to inmates with no prior mental health treatment.

b. Compared to non-Hispanic Whites.

c. compared to inmates under age 30.

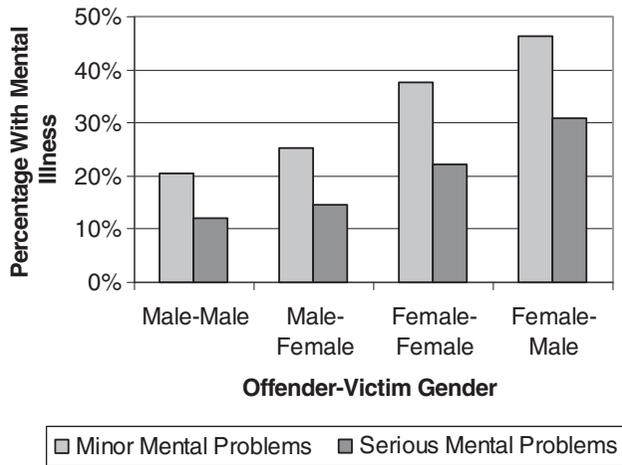
d. Compared to inmates who drank less than monthly.

e. Compared to inmates not drinking during the offense.

f. Compared to inmates not using drugs during the offense.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

$p = .118$ ; full model results available on request). These results provide partial support for the deviance hypothesis. Women who commit assaultive violence are likely to have higher rates of major mental health problems but not minor mental health problems. Major mental health problems appear to play a greater role in the violence of female offenders than male offenders.



**Figure 1: Mental Health Problems by Gender of Offender and Victim for Violent Offenses ( $n = 2701$ )**

Note. The graph depicts predicted percentages derived from the logistic regression equations shown in Table 5. All other measures are held constant at their mean values.

Contrary to the deviance hypothesis, Table 5 shows that older offenders are no more likely than their younger counterparts to have mental health problems. On the other hand, consistent with the deviance hypothesis, offenders who attack their own children are more likely to have serious mental health problems than those who attack strangers. Interestingly, the table also shows that offenders who attack family members, partners, and other known people are more likely to have mental health problems. This also supports the deviance hypothesis, given evidence that serious assaults on family members are considered more serious offenses (Felson, Ackerman, & Yeon, 2003). Another possible explanation for these findings is that people with mental health problems may spend more time at home, bringing them into greater contact with children, family, and other known people (Swanson et al., 2006). However, when we controlled for whether the assault occurred inside or outside the home, the results remained unchanged (full results available from authors).

Note that serious mental health problems are related to the number of prior *violent* offenses but not the number of prior sexual, property, drug, or other offenses (as shown in Table 5). This result provides further support for the idea that mental illness is uniquely related to assaultive violence. The table also reveals evidence that mental health problems are related to racial/ethnic status, prior victimization, and to drug and alcohol use.

## DISCUSSION

A major problem in studying the relationship between mental disorder and violence has been the difficulty of eliminating spuriousness from the analysis (Hiday, 2006; Link et al., 1992). This is because many of the individual and social factors that affect violence also affect mental illness. To isolate the effect of mental health problems on current violence,

we used a retrospective longitudinal design in which we controlled for prior violence and other potentially confounding factors, such as alcohol and drug use and prior victimization. We found that among incarcerated offenders, mental health problems were more strongly associated with assaultive violence and sexual offenses than with other types of crimes. We provided evidence against the possibility that violence was associated with mental health treatment because violent offenders were more likely than other offenders to receive treatment; we found an effect for mental health problems even when those who received treatment in prison were excluded. It is possible that violent offenders were more likely to receive treatment after they committed the offense but before incarceration, but this would not explain the similar findings using a measure of self-reported current mental illness.

### THE DEVIANCE HYPOTHESIS

We also examined whether offenses committed by people with mental health problems tend to be particularly anti-normative. The deviance hypothesis is based on the idea that disordered thinking is more likely to affect the tendency to commit crime for which there are strong inhibitions than it is to affect ordinary crime. It also reflects the augmentation principle in attribution theory, which states that behavior that occurs in spite of strong norms and other external forces is indicative of a strong internal force that overcomes those constraints. Although all of these offenses involved anti-normative behavior, some were more deviant than others. Unfortunately, we did not have information on details of the offense that indicated the level of deviance. We relied instead on information regarding type of crime, gender, and age.

In support of the deviance hypothesis, we found that mental health problems played a greater role in sexual offenses than physical assault. Mental health problems also played a greater role in homicide than physical assault, though the effects were relatively weak. The weak effects could be caused by measurement problems associated with death of the victim as a measure of seriousness. The difference between a homicide and a serious assault in this data set often reflects chance or the quality of medical care rather than the lethal intent of the offender.

Our evidence regarding gender generally supported the deviance hypothesis. Men who assaulted or killed men—the most common type of violent assault—were least likely to have mental health problems. In addition, women who committed assaultive violence were more likely to have mental health problems than men who committed these offenses. The gender difference in major mental health problems was stronger for assault than property crimes, suggesting that gender differences in mental illness and treatment could not fully explain the higher rate of mental health problems observed among female assault offenders. The results provide some support for the argument that mental illness plays a greater role in the violence of female offenders than male offenders.

On the other hand, the evidence regarding the gender of victim was mixed. Although men who assaulted women were more likely to have mental health problems than men who assaulted men, the reverse was true for female offenders. Women who assaulted men were more likely to have mental health problems than women who assaulted other women. This evidence is inconsistent with the deviance hypothesis, if one views any violence against women as more serious (Felson, 2002). One possible explanation of the finding is that people with mental health problems have impaired judgment, which leads them to engage

in more risky and dangerous behavior. It is more risky for women to assault men because men are physically stronger and more prone to violence. Mental illness may undermine the capacity to control one's own behavior or to consider carefully the consequences of that behavior (Link & Stueve, 1995; Swanson et al., 2006). The finding could also be interpreted as consistent with attribution theory. If someone engages in a behavior despite the high potential cost, it suggests that some strong offsetting internal factor, such as mental illness, may have been present. Fear of physical harm and social disapproval are external inhibiting forces for violence.

Our evidence regarding the age of the offender does not support the deviance hypothesis. Older violent offenders were no more likely to have mental health problems than younger offenders, even though violence is less normative among older offenders. This may be because older people are less likely than younger people to have mental illnesses (Robins & Regier, 1991), a pattern that would offset any positive effect of age on level of deviance. On the other hand, the evidence regarding age of the victim did provide support for the hypothesis: Offenders who attacked children were more likely to have serious mental health problems than those who attacked other victims. This finding probably reflects both the age of the victim and the victim's relationship to the offender. Offenders who assaulted anyone they knew were, to some extent, more likely to have mental health problems. We view this finding as consistent with the deviance hypothesis, as there are strong inhibitions about assaulting family members and others one knows.

These results raise the possibility that mental illness leads to deviant behavior rather than violent behavior. The former refers to rule breaking, whereas the latter describes behavior whose goal is to physically harm the victim. Not all harm doing is deviant behavior, and not all deviant behavior involves an intention to harm others (even when the behavior actually does harm). The evidence that mental illness was particularly likely to be involved in more deviant offenses supports this perspective. So does the finding that mental illness was most strongly related to sexual offenses, some of which did not involve violence. In analyses not presented, we separated molestation and statutory rape from sexual assault and found no difference between these offenses in the role of mental illness. Although some scholars might argue that mental illness was attributed after the fact to those who engage in deviance, we found these results when treatment preceded the current offense and when controlling for past offending. Our evidence, therefore, suggests that mental illness is a causal factor in deviant behavior, some of which involves violence, and that the more deviant the behavior, the greater the effect of mental illness.

#### STRENGTHS AND LIMITATIONS

This is the first study to examine the effects of mental health problems on violence using a sample of incarcerated offenders. The sample brings with it several advantages. First, we were able to examine more serious types of violent acts than prior studies that used samples from the general population. Second, because everyone in the sample was convicted of a crime, we were able to control by design for factors related to criminal behavior more generally. Third, using a convicted offender sample enabled us to minimize "criminalization of mental illness" as an alternative explanation.

We have already discussed the major limitations of our study: the unknown generalizability of results from an inmate sample, the fact that we cannot compare violent offenders

with nonoffenders, and the measurement of mental health problems. Future research must determine the generalizability of these results beyond the prison walls. That research should control for prior violence, not other forms of misconduct, given the evidence that mental health is unrelated to number of prior nonviolent offenses. The lack of a relationship between mental health and nonviolent offending also suggests that the controls for prior general misconduct used in previous longitudinal research may not have been adequate (Arseneault et al., 2000; Swanson, 1993). It also suggests, at least tentatively, that our results would be similar if we had compared violent offenders to nonoffenders.

Regarding measurement error, we view our analysis as a conservative test of the association between mental health problems and violence. We are encouraged by the fact that we obtained similar results using a measure based on self-reported mental illness, even though that measure was rather weak. Future research must determine whether the findings hold up with better measures of mental illness, particularly measures that reflect diagnostic categories and symptomatology. Because our measure is nonspecific, the observed effects presumably reflect an average across all types of emotional problems that lead people to receive treatment. In sum, mental health problems are more strongly associated with assaultive violence and sexual offenses than with other types of crimes. We believe that our study provides strong evidence that this association is causal. In addition, the results suggest that there is some validity to the folk wisdom that mental illness is implicated in the most anti-normative violent behaviors.

## NOTES

1. In addition, several European birth cohort studies (Belfrage, 1998; Brennan, Mednick, & Hodgins, 2000; Hodgins, Mednick, Brennan, Schulsinger, & Engberg, 1996; Tiihonen et al., 1997; Wessely, 1997) and one study in Victoria, Australia (Mullen, Burgess, Wallace, Palmer, & Ruschena, 2000) have been conducted, all of which have found significant associations between mental disorder and violence. Although consistent with the findings of most U.S. studies, the authors of the European studies generally caution that their results are only generalizable to other industrialized Western countries that possess relatively low crime rates (e.g., Sweden, Denmark, Norway, United Kingdom, Canada) and may not be generalizable to the United States.

2. Based on diagnoses made during an acute psychiatric inpatient stay, Steadman et al. (1998) found no difference in the rates of violence between psychiatric patients and a community control sample among those without substance abuse problems. They did, however, observe a higher rate of violence for mentally disordered patients with substance abuse problems.

3. Although offenders may avoid prosecution for a particular offense, eventually most repeat offenders are probably caught. This factor decreases the selection bias.

4. To check for bias in our results, we re-ran the analyses excluding the 3.7% of cases that were imputed. The results were practically identical to those reported here (results available on request).

5. There are many female drug offenders, so we could have compared assault offenders to drug offenders as well. However, because drug use leads to mental illness and treatment, the relationship is likely to be inflated.

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