

beyond what they have seen or heard,” whereby “observers can evolve new forms of aggression” (1978; p 14). Still, a social learning perspective implies that the modeling of specific behaviors should be strongest as it is the most direct lesson learned from the model. The effect of a particular form of abuse on related behavior requires more inference on the part of the observer.

It is still not clear, however, *exactly* what children learn from abusive models. For example, do children who have been sexually abused learn to engage in sexual offenses against children or sexual offenses generally? Do people who have been physically abused learn to use violence when disciplining their children, or violence in any conflict situation, or violence generally? If children learn that violence is an appropriate role behavior for parents they should be more likely to engage in violence against their own children than other forms of violence. The modeling process involves role learning. If individuals learn to use violence when they are angry during a dispute then they should be more likely to engage in homicide and assault than robbery and rape. The former are much more likely to stem from disputes [Felson, 1993]. Finally, if abused individuals learn violence as a general means of adaptation then they should be more likely to engage in violent offenses than nonviolent offenses. They should commit robbery and sexual assault (as well as homicide and assault) more often than they commit property crime.

Social learning theory is not the only explanation of the effects of abuse. Other theories about the effects of abuse imply different predictions. According to attachment theory, mistreatment of *any type* leads children to think that the world is a hostile place and interferes with their ability to develop satisfactory relations with others [e.g., Crittenden and Ainsworth, 1989]. Thus, Dodge et al. [1990] found that children who had been abused were more likely to develop a hostility bias [see also Weiss et al., 1992]. They think others have aggressive intentions toward them when they do not. If mistreatment leads to a hostility bias, then we would expect that *both* physical and sexual abuse lead to crime. In addition, abuse should have stronger effect on homicide and assault than on other crimes. If people think others have attacked them they are likely to be angry and retaliate with a physical assault. Abuse should lead to dispute-related crime not predatory crime.

It could also be that the effects of weakened attachments are more general. If children have a weak attachment to their parents they may be

resistant to parental influence, and therefore may be more likely to commit crime generally. Control theory also implies that abuse weakens bonds with parents, which then leads to a variety of criminal behaviors [Hirschi, 1969]. From these perspectives, any type of parental maltreatment leads to a variety of behavioral problems later on. We should not observe the effects of abuse on different offenses as our sample only includes offenders.

Some scholars suggest that victims of child abuse experience post-traumatic stress disorder that continues into adulthood [Deblinger et al., 1989; Kisler et al., 1991]. Thus, Widom [1995] suggests that the effect of sexual abuse on criminal behavior later in life may result from the trauma and stress, not from the specifically sexual nature of the incident. The predictions of this theory are similar to the predictions of attachment theory. Both types of abuse should have effects. However, it is not clear what the long-term consequence of stress should be. According to those who take a frustration-aggression approach [e.g., Berkowitz, 1989], stress and other aversive stimuli result in angry or reactive aggression. From this perspective abuse should be more strongly associated with homicide and assault than other crimes, as the former are more likely to involve angry aggression (as opposed to instrumental aggression). On the other hand, according to general strain theory [Agnew, 1992] stress results in a variety of criminal behaviors. From this perspective, one might expect abuse to be associated with offending but it should not affect the type of crimes offenders commit. As before, we should not observe effects of abuse on different offenses as our sample only includes offenders. Finally, it is possible that stress resulting from child abuse results in mental illness and this increases the likelihood of violent and sexual offenses. An analysis of the same data set used in this study found that a history of mental health treatment was more strongly associated with assaultive violence and sexual offenses than with other types of crimes [Silver et al., 2008; see, also Noll, 2008; Fergusson et al., 2008].

PRIOR RESEARCH LINKING ABUSE AND SPECIFIC OFFENSES

Most researchers who study the effects of abuse on criminal behavior do not distinguish deviance (i.e., rule breaking) from violence (i.e., intended acts of physical harm). They examine a particular type of abuse on a particular type of behavior without making comparisons. There are a few studies that

examine the effects of different types of abuse on particular outcomes, however. We focus on these studies in our review as they are most relevant to this study.

Three studies have found evidence that particular types of abuse are associated with particular type of offenses. In a study of 101 delinquent adolescents, Tarter et al. [1984] found that those who had been physically abused were more likely to engage in violent offenses (vs. nonviolent offenses) than those who had not been abused. Graham [1996] examined the victimization experiences of sexual offenders ($n = 286$). He found that 70% of respondents reported experiencing sexual victimization as a child, whereas 50% reported physical victimization. Ford and Linney [1995] found that child molesters were more likely to have a history of sexual abuse than rapists and nonsexual violent offenders in a sample of 56 delinquents.

Other studies have not found evidence that particular types of abuse are associated with particular type of offenses. Spaccarelli et al. [1997], studying a sample of 210 delinquents, found that sexual aggressive offenders were not significantly more likely to have been sexually abused than other offenders. Widom [1989a,b] studied 908 children who were processed through the court system in 1967 and 1971 as victims of physical abuse, sexual abuse, or neglect, and a control group matched in terms of their age, race, sex, and socioeconomic status. Subjects' arrest records were examined in 1988 and 1994 to determine whether childhood victimization was related to later criminal behavior. A multivariate analysis showed that physical abuse, neglect, and sexual abuse were all associated with arrests for violent offenses as adults, although the effect for sexual abuse was not statistically significant. The strongest effect was observed for physical abuse, but no statistical tests were performed to determine whether its effect was significantly stronger [see also Widom and Maxfield, 2001]. The relationship between different types of abuse and nonviolent crime was not examined. In a later study based on the same data set, Widom [1995] examined the effects of different types of child abuse on the likelihood of an adult arrest for a sexual offense. She found that physical abuse but not sexual abuse was related to an arrest for rape or sodomy.

McCord [1983] examined the adult criminal records of 232 boys whose parents were described by counselors as either loving, rejecting, neglectful, or punitive. The evidence suggested that children who had parents that were rejecting, neglectful, or punitive were more likely to have criminal records as

adults. Punitiveness was no more strongly associated with violent crime than other forms of maltreatment. Finally, Matt [1992] used clinician's reports to examine relationships between physical abuse and psychological neglect by parents, and assaultiveness and delinquency for a sample of emotionally disturbed children. She did not find that the relationship between physical abuse and assaultiveness was stronger than the relationship between other combinations of parental maltreatment and children's misbehavior.

In sum, the evidence is mixed from these studies. It is not clear whether the discrepant findings are due to differences in measurement or sampling, or to the fact that most studies are based on small samples. We do not know whether there is an intergenerational transmission of violence or sexual behavior, or whether any type of mistreatment causes children to commit violent crime or crime generally when they become adults.

SPECIALIZATION

If different offenses have a common etiology, then offenders should be versatile, i.e., they should commit a variety of crimes. On the other hand, to the extent different types of offenses have a unique etiology, we should observe specialization. Offenders who commit multiple offenses should repeat offenses of the same type over their criminal careers. Social learning theory implies higher levels of specialization. To the extent physical abuse results in violent offenses and sexual abuse results in sexual offenses, we should observe specialization in these offenses. Explanations emphasizing attachment, weakened controls, and post-traumatic stress syndrome, on the other hand, imply versatility in offending.

Although many criminologists argue that most offenders are versatile, evidence suggests that there is a fair degree of specialization. For example, Osgood et al. [1988] found that roughly half of the stable and reliable variance in a variety of deviant behaviors was general or shared variance. They found plenty of nonshared variation to be explained. More recently, Deane et al. [2005] find strong evidence for offense specialization among adolescents. They show that violent offenders are much more likely to engage in additional violent offenses, whereas nonviolent offenders are much more likely to engage in additional nonviolent offenses.

There is also a fairly extensive literature examining specialization in sexual offending. Some studies

suggest that sexual offenders are more specialized than other offenders [e.g., Hanson et al., 1995; Langan et al., 2003; Sample and Bray, 2003]. Some studies suggest that they are less specialized than other offenders [Meithe et al., 2006] while others find no difference [e.g., Lussier et al., 2005; Soothill et al., 2000]. The results depend on the measure of specialization used, the sample, and the degree to which the offense categories are restrictive. In addition, some studies do not control for the fact that sexual offenses occur much less frequently than other offenses. As a result, an offender's next offense is less likely to be a sexual offense than some other offense. However, in general, the literature does seem to suggest that sexual offenders are more likely to commit future sexual offenses than are other offenders, indicating a degree of specialization. Based on a review of the literature, Lussier concludes that "sexual offenders' criminal behavior is characterized by a certain tendency to specialize in sexual crime over time against the backdrop of much versatility" (2005; p 288).

THE CURRENT STUDY

We examine the issues of special etiology and specialization based on self-report data from a nationally representative sample of male inmates. Our use of a large sample of inmates gives us a sufficient number of cases to examine the relationship between specific types of abuse and particular types of adult offenses. We first examine whether childhood sexual and physical abuse are more strongly associated with some offenses than others. Social learning theory suggests that sexual and physical abuse have different effects. Specifically, it predicts that

- (1) Sexual abuse during childhood is associated with adult sexual offending, particularly sexual offenses against children.
- (2) Physical abuse during childhood is associated with adult violent offending.

Social learning theory does not make a clear prediction about whether offenders who have been physically abused are more likely to engage in assaultive violence (homicides and assaults) than robbery and rape. If they are modeling the use of violence in interpersonal conflicts we would expect more violence during assaultive violence. If offenders have learned to use violence as a general means of adaptation, or as a means of getting one's way,

we should observe no difference. In a supplementary analysis, we will also determine whether physically abused offenders are particularly likely to engage in violence against their own children.

According to attachment theory, abuse produces a hostility bias, which should produce the following pattern:

- (3) Physical and sexual abuse are both associated with adult assaultive violence (vs. other offenses).

Support for hypothesis 3 would also be consistent with the idea that abuse produces post-traumatic stress syndrome. Stress should lead to angry aggression but not instrumental aggression, according to a frustration-aggression approach. On the other hand, if poor attachment decreases parental influence, then abuse of any type should lead to all types of offending. Any type of mistreatment of children should increase the likelihood of criminal behavior. Strain theory would make the same prediction. As we only study offenders, these perspectives would predict that

- (4) Sexual and physical abuse are unrelated to the type of current offense.

We will also examine, in a supplementary analysis, whether the effects of abuse are mediated by mental illness. One interpretation of the post-traumatic stress argument is that stress produces mental illness and mental illness leads to violent or sexual offenses. If this is the case then the effects of abuse should be reduced or eliminated when one controls for mental illness and frequency of drinking.

Finally, we examine the question of specialization in offending. If different types of abuse have different effects then we should have some specialization. To examine this issue we include the prior offense history of offenders in our equations. To the extent that offenders specialize we expect their prior offenses to be the same as the offense that led to their current incarceration. For example, offenders with a prior sexual offense should be more likely to commit a later sexual offense than other offenses. Offenders who have engaged in assaultive violence (homicide or assault) should be more likely to repeat the same type of offense.

For our purposes additional information about the criminal history of these offenders is unnecessary. We are sampling the most recent offense that led to incarceration, and there is no strong reason to think that this offense is not representative of their

offending history. In addition, although measurement error on the dependent variable can influence the intercept or increase the size of standard errors, *it does not bias parameter estimates* [Alwin, 2007]. In a regression framework, it is measurement error in independent variables that can potentially bias parameter estimates in the model. We address the issue of error in our measures of child abuse and prior offending below.

Discriminant Prediction

Our examination of the association between different independent variables and different dependent variables involves a form of theory testing that has been called “discriminant prediction” [Felson, 2002]. This concept is similar to the concept of “discriminant validity” in measurement theory. This method tests theories by determining whether variables predict what they should and not what they should not [Felson, 2002]. Experimental psychologists use the same method—they call it “control construct design”—when they compare the effect of a treatment on the predicted outcome to its effect on a related outcomes that should not be affected [McKillip and Kimm, 1990; Shadish et al., 2002]. The method has also been used in criminology. For example, Gottfredson and Hirschi [1990] use claims about the versatility of offenders and the common causes of different crimes and analogous behavior to argue that low self-control is the key element in crime. It is arguably their most influential piece of evidence. Zimring and Hawkins [1997] have shown that the United States has higher rates of homicide but not other violent or nonviolent crime than European countries (see also Van Dijk, 2008); the pattern casts doubt on some well-known theoretical explanations.

Discriminant prediction is particularly useful method in the study of abuse and violence because of the limitations of more traditional methods. First, abuse is difficult to measure. One must rely on either self-reports or official statistics and both can be unreliable. As discriminate prediction involves comparisons of the relative strength of effects, measurement issues are not as problematic. We are interested in the relative size of coefficients, not their absolute size. Suppose, for example, that the sexual abuse variable has more measurement error than the physical abuse variable. That should weaken its relationship to all outcomes. Measurement error would not explain why sexual abuse is more strongly related to sexual offenses than to physical assault.

This same argument applies to effects involving prior offending.

Second, theory testing is difficult in this area because surveys that are available do not typically include measures of possible mediating variables. In addition, the mediating variables implied by a modeling process are difficult to measure. Discriminant prediction, on the other hand, does not require the examination of mediating variables.

Finally, it is particularly difficult to address the issue of spuriousness in the study of abuse and violence, even with longitudinal data. The biggest problem is that no one is able to adequately control for the child’s violent or sexual behavior before the abuse (if that behavior is even measurable). Dodge et al.’s [1990] study comes closest as it at least controls for maternal perceptions of childhood temperament [see also Weiss et al., 1992]. With discriminant prediction, alternative explanations of the patterns observed require one to posit systematic biases that produce specific correlations but not others. Although there are likely to be omitted third variables that are associated with abuse and crime, one can argue that they are unlikely to affect the relative strength of relationships between specific types of abuse and specific types of crime. Of course, confidence about inferences about causality is always limited with correlational data. Although discriminant prediction is not a panacea, it can make a contribution.

Recently, Noll [2008] has called for the examination of the unique effects of childhood sexual abuse on different emotional problems [see also, Fergusson et al., 2008]. She suggests, “the importance of ascertaining and evaluating the relative impact of childhood sexual abuse throughout development cannot be understated (p 603).” Further, anticipating our approach, she argues that such an approach addresses the issue of *why* sexual abuse might be a particularly important risk factor in the development of mental health problems. Our research applies her reasoning to the understanding of criminal outcomes.

METHODS

Data for this research comes from the Survey of Inmates in State and Federal Correctional Facilities, 1997, conducted by the US Census Bureau on behalf of the Bureau of Justice Statistics and the Bureau of Prisons [Bureau of Justice Statistics, 2000]. The survey is based on nationally representative samples of inmates from state and federal facilities.

Participants were selected using a two-stage stratified selection process. The first stage involved selecting prisons from a universe of 1,409 state and 127 federal prisons. Inmates were then selected from the sampled prisons, resulting in a total of 14,285 respondents from state facilities and 4,041 from federal facilities. Interviews were conducted using computer-assisted personal interviewing. The response rate was 92%.

Our total sample includes 14,530 male offenders; after list-wise deletion of cases with missing data, our sample size was 13,964. We restrict the analysis to men because of our particular interest in sexual offenses; women rarely commit sexual offenses [Vandiver and Walker, 2002]. Indeed, only 3.5% of the sexual offenders in our inmate sample were women.

The dependent variable used in these analyses is based on the primary offense that resulted in the offender's current incarceration. Offense codes were collapsed into the following categories: sexual offense against a child (under age 18); sexual assault against an adult (including forcible rape); assaultive violence; robbery; and nonviolent offenses. This variable had the most missing values (1.7%), primarily because of missing data on the age of the victim and because we omitted a few rare crimes that did not fit into our crime categories (e.g., kidnapping). As the dependent variable includes multiple categories, we use multinomial logistic regression to estimate coefficients. Our reference category is nonviolent offenses.

Murder, assault, and voluntary manslaughter are classified as assaultive violence. Involuntary manslaughter is classified as a nonviolent offense as the offender does not intentionally harm the victim. We treat robbery as a separate category because it is a violent crime that does not typically involve anger or a grievance. Other offense types were grouped together into a nonviolent offense category.

Sexual offenses included forcible rape, statutory rape, sexual assault, and lewd behavior with a child. Respondents were asked the age of the victim, allowing us to distinguish between offenses that targeted children and those that targeted adults. A sexual assault against an adult is considered both a sexual and a violent offense. Sexual offenses against children, on the other hand, often do not involve overt force [Groth, 1979; Noll et al., 2000]. They can be charged as assaults because it is assumed that they involve force; children are viewed as incapable of giving consent. The statutes vary by state. In the state of Ohio, for example, offenders who have sexual relations with someone under age

13 are charged with sexual battery, whether they used violence or not.

The *childhood sexual abuse* variable is based on two questions. First, respondents were asked: "Before your admission to prison on (date) had anyone ever pressured or forced sexual contact against your will, that is, touching of genitals, or oral, or anal sex." Respondents who answered in the affirmative were then asked whether "the sexual contact against your will" occurred before age 18. From these items we constructed a dichotomous variable based on whether the respondent reported that they had been sexually victimized before age 18. The *childhood physical abuse* variable was also based on two items: Respondents were asked: "Before you were admitted to prison on (date), had you ever been physically abused?" If the respondent indicated they had been physically abused, they were asked whether this incident(s) occurred before age 18. As before, a dichotomous variable was constructed. Note that, although our measures are crude, this is not so problematic when using the method of discriminant predictability. We are interested in the relative strength of effects not their absolute strength.

Offenders were also asked about their history of prior convictions that resulted in incarceration or probation as an adult or a juvenile. We constructed dichotomous variables based on whether respondents had ever been incarcerated or put on probation for sexual offenses, assaultive violence, robbery, or nonviolent offenses. Because information on victim age was not available for prior offenses it was necessary to treat sexual offenses as a single category. Our other offense classifications are the same as we used for current offense.

Our alcohol measure is based on self-reports of drinking over the year before 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 drank less than monthly. Mental health problems were measured as a set of dummy variables with three categories: serious mental health problems, minor mental health problems, and no mental health problems (the reference category). Inmates were asked whether, due to a mental or emotional problem, they had ever (1) "Been admitted to a mental hospital, unit or treatment program where you stayed overnight?" (2) "Taken a medication prescribed by a psychiatrist or other doctor?" (3) "Received counseling or therapy from a trained professional?" (4) "Received any other mental health services?" Overnight

admission to a hospital, unit, or program was taken as evidence of serious mental health problems. Those who reported no such treatment, but had received medication, counseling, or other services before the offense were coded as having a minor mental health problem. All other cases were coded as having no mental health problem.

Finally, our equations also include controls for race/ethnicity, age at the time of offense, and years of education. Race/ethnicity is measured using three dummy variables to represent four categories: African American, Hispanic, other races, and non-Hispanic whites (the reference category). The number of years the respondent attended school is used as a measure of education.

RESULTS

Frequencies are presented in Table I. The table shows that approximately 60% of respondents were in prison for committing nonviolent offenses. The most frequent nonviolent offenses involve drugs (26.5%) and property crime (19.5%). More than

17% committed a homicide or assault, identified as assaultive violence, and 15% committed a robbery. Sexual offenses are relatively rare; approximately 7% of the sample committed these offenses. The pattern for prior offenses is similar. Finally, although 35.8% reported an experience of physical abuse as a child, only 4.4% reported that they had experienced sexual abuse.

Multivariate Analyses

In Table II we present results from a multinomial logistic regression where we predict the current offense. The table suggests that offenders who have experienced sexual abuse are much more likely to commit sexual offenses than nonviolent offenses. This effect is particularly strong for offenders who commit sexual offenses against children. The odds of an offender committing a sexual offense against a child (vs. a nonviolent offense) is more than eight times higher if he has been sexually abused. For sexual assault against adults, the odds are 2.3 times higher. On the other hand, the relationships between sexual abuse and assaultive violence and robbery are small and not statistically significant. The results support the hypothesis that sexual abuse leads to sexual offenses, particularly sexual offenses against children.

Table II also suggests that offenders who have experienced physical abuse are more likely to commit violent offenses than nonviolent offenses. The coefficients for assaultive violence, robbery, and sexual assaults on adults are all positive and statistically significant. The coefficient for physical abuse and sexual offenses involving children, on the other hand, is small and nonsignificant. As most sexual offenses against children do not involve violence, this pattern is consistent with the hypothesis that physical abuse only leads to violent offenses. Note, however, that the effects of physical abuse on violent offenses are much weaker than the effects of sexual abuse on sexual offenses. For example, the odds of an offender committing assaultive violence is about 1.8 times higher if he has been physically abused. Finally, the effect of physical abuse on assaultive violence (vs. nonviolent crime) is not much different from its effects on robbery and sexual assault on adults.

Table II also reveals evidence of offense specialization, particularly for sexual offenses. Offenders with a prior sexual offense are much more likely to commit sexual offenses against children and adults than nonviolent offenses. Offenders with a prior offense involving assaultive violence are more likely

TABLE I. Frequencies ($n = 13,964$)

Variable	%	SD
Current offense		
Sexual (victim age: 17 or younger)	5.0	.22
Sexual (victim age: 18 or older)	2.1	.14
Assaultive violence	17.6	.38
Robbery	15.2	.36
Nonviolent	60.1	.49
Sexual abuse	4.4	.20
Physical abuse	35.8	.48
Prior sexual offense	1.5	.12
Prior assaultive violence offense	12.6	.33
Prior robbery offense	9.4	.29
Prior nonviolent offense	54.2	.50
Race/ethnicity		
Black	44.7	.50
White	33.5	.47
Hispanic	18.2	.39
Other	3.6	.19
Mental health problems		
Serious	9.3	.29
Minor	15.5	.36
None	75.2	.43
Alcohol use		
Daily/almost daily	27.3	.45
At least once a week	23.5	.42
More than once a month	14.4	.35
Never/almost never	34.8	.48
	Mean	SD
Age	34.2	10.18
Education	10.8	2.55

TABLE II. Multinomial Logistic Regression with Nonviolent Offense as Reference Category ($n = 13,964$)

Variable	Sexual offense against youth		Sexual assault on adult		Assaultive violence		Robbery	
	<i>B</i> (SE)	Exp (B)	<i>B</i> (SE)	Exp (B)	<i>B</i> (SE)	Exp (B)	<i>B</i> (SE)	Exp (B)
Intercept	-2.162*** (.257)		-4.224*** (.391)		-.962** (.153)		-0.762** (.167)	
Sexual abuse	2.089*** (.130)	8.073	0.841*** (.224)	2.319	0.193* (.123)	1.213	0.166*** (.137)	1.180
Physical abuse	0.165*** (.096)	1.179	0.551*** (.130)	1.735	0.593** (.051)	1.809	0.469** (.054)	1.598
Prior sexual offense	2.018*** (.199)	7.521	1.872*** (.262)	6.501	0.041*** (.232)	1.042	0.090*** (.254)	1.094
Prior assaultive violent offense	-0.440** (.156)	0.644	-0.175 (.192)	0.840	0.350** (.066)	1.419	-0.031 (.076)	0.969
Prior robbery offense	-0.686** (.248)	0.504	-0.436 (.285)	0.647	0.102 (.090)	1.107	1.357** (.072)	3.883
Prior nonviolent offense	-0.918*** (.090)	0.399	-0.791*** (.125)	0.454	-0.660** (.049)	0.517	-0.477** (.053)	0.620
Black	-0.996*** (.108)	0.369	0.454** (.140)	1.575	0.366*** (.057)	1.442	0.525*** (.061)	1.690
Hispanic	-1.077*** (.141)	0.341	-0.470* (.222)	0.625	-0.018 (.073)	0.982	-0.101 (.083)	0.904
Other race	0.380* (.175)	1.462	0.816** (.263)	2.261	0.507*** (.122)	1.661	0.117 (.155)	1.124
Age	0.032*** (.004)	1.032	0.024*** (.006)	1.024	0.000 (.002)	1.000	-0.023*** (.003)	0.977
Education	-0.082*** (.015)	0.921	-0.038 (.023)	0.963	-0.066*** (.009)	0.936	-0.021 (.011)	0.979
Minor mental health problems	0.705*** (.103)	2.024	0.576*** (.159)	1.778	0.548*** (.063)	1.731	0.201** (.072)	1.222
Serious mental health problems	0.300* (.139)	1.350	1.010*** (.169)	2.745	0.543*** (.080)	1.721	0.336*** (.089)	1.399
Alcohol less than once per week	-.155 (.129)	0.856	0.239 (.188)	1.270	0.237** (.074)	1.268	-0.086 (.081)	0.918
Alcohol at least once a week	-0.170 (.114)	0.843	0.298 (.163)	1.347	0.282*** (.063)	1.325	-0.034 (.068)	0.967
Alcohol daily/almost daily	-0.273* (.112)	0.761	0.238 (.158)	1.268	0.204** (.062)	1.226	0.041 (.064)	1.042

* $P < .05$; ** $P < .01$; *** $P < .001$.

to commit assaultive violence and offenders with a prior robbery offense are much more likely to commit robbery. The coefficients for prior nonviolent offenses are all negative indicating that respondents with this history are much less likely to commit a violent crime or a sexual offense. We also find that offenders with a prior robbery offense are unlikely to commit sexual offenses and offenders with a prior assaultive violence offense are less likely to commit a sexual offense against a child. In no instance do we observe a significant positive relationship between violent offenses and subsequent sexual offenses or between sexual offenses and subsequent violent offenses.

Table II also shows substantial effects of mental health problems on violent and sexual offenses. Alcohol use, on the other hand, is only weakly

related to physical assault and sexual assaults on adults. Drinkers are more likely than nondrinkers to engage in these offenses regardless of how frequently they drink. Although the effects of alcohol on sexual assault are not statistically significant in these analyses, we do observe a statistically significant effect when we substitute a single dummy representing drinkers vs. nondrinkers ($B = 0.260$; $P = .049$).

Finally, we note the effects of the demographic variables. Blacks are more likely to engage in violent offense than nonviolent offenses and they are less likely to engage in sexual offense against children. Hispanics are less likely to engage in sexual offenses than nonviolent offenses. Older offenders are more likely to engage in sexual offenses and less likely to engage in robbery. Finally, offenders with more education are less likely to engage in sexual offenses

against children and less likely to engage in assaultive violence.

Supplementary Analyses

In Table III we address the possibility that mental health problems, including frequent drinking, mediate the effects of child abuse on current offense. We re-estimated our equations excluding the measures of drinking and mental health problems. In general, these analyses show that the direct effects of abuse on offense type decrease somewhat when one adds these potential mediating variables to the equation. The proportional reduction in effects ranges from 4 to 44% with an average of about 20%. Note that estimates of reductions are unstable particularly when the effects are small [Kenny et al., 1998]. As our largest reductions are on abuse effects that are already small we cannot be confident about the size of specific reductions. We have more confidence interpreting the overall pattern. Our conclusion, then, is that a minor portion of the effects of physical and sexual abuse on offending may be mediated by emotional problems. An alternative interpretation, however, is that the criminal offense type mediates the relation between abuse and mental health problems. We could not establish the exact causal ordering of criminal offending and other problems in this study, as we do not know which occurred first.

We also examined whether childhood physical abuse is more strongly related to later assaults on children than to assaults on other victims. It may be

that offenders model assaultive violence against their children rather than assaultive violence generally. To explore this issue, we restricted analyses to assaultive violence and examined whether offenders who had been physically abused were more likely to have assaulted or killed their child/step-child vs. someone else. The effect was small and statistically insignificant ($B = 0.076$; $P = .819$). We also examined whether abuse was more likely to lead to attacks on victims under 18 (vs. victim 18 and older). The coefficient was in the predicted direction but it was not statistically significant ($B = 0.213$; $P = .136$).

We also examined whether the results were different when we used more refined categories for sexual offenses against children. We were interested in whether sexual abuse had different effects on different types of sexual offenses or on offenses against children vs. teenagers. We re-estimated our multinomial logistic regression equation substituting the following categories for sexual offenses against children: lewd behavior against a child, statutory rape; sexual assaults against children under 13; sexual assaults against children 13–17. The effects of sexual abuse were similar for each category. This evidence suggests that the effects of sexual abuse do not depend on the age when it occurred or whether the victim “consented.”

Although some of the coefficients we observe in Table II are quite strong it could be argued that they are conservative estimates because we include past offending. When we estimated an equation without these variables the coefficients did not change much. Nor did the coefficients for past

TABLE III. Multinomial Logistic Regression with Nonviolent Offense as Reference Category, Mental Illness and Alcohol Mediation ($n = 13,964$)

Variable	Sexual offense against youth		Sexual assault on adult		Assaultive violence		Robbery	
	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)
Sexual abuse	2.195*** (.127)	2.089*** (.130)	1.097*** (.219)	0.841*** (.224)	0.355** (.121)	0.193* (.123)	0.241 (.136)	0.166*** (.137)
Physical abuse	0.194* (.095)	0.165*** (.096)	0.649*** (.128)	0.551*** (.130)	0.662*** (.050)	0.593** (.051)	0.494*** (.054)	0.469** (.054)
Minor mental health problems		0.705*** (.103)		0.576*** (.159)		0.548*** (.063)		0.201** (.072)
Serious mental health problems		0.300* (.139)		1.010*** (.169)		0.543*** (.080)		0.336*** (.089)
Alcohol less than once per week		-0.155 (.129)		0.239 (.188)		0.237** (.074)		-0.086 (.081)
Alcohol at least once a week		-0.170 (.114)		0.298 (.163)		0.282*** (.063)		-0.034 (.068)
Alcohol daily/almost daily		-0.273* (.112)		0.238 (.158)		0.204** (.062)		0.041 (.064)

* $P < .05$; ** $P < .01$; *** $P < .001$; Equation includes controls for race/ethnicity, age, education, and prior offenses.

offense change much when we omitted the abuse variables.

Finally, we estimated an equation that included controls for physical and sexual abuse as an adult. The variables were associated with the offense committed but the effects of child abuse remained with these control variables included.

DISCUSSION

Our examination of the relative strength of relationships between different types of childhood sexual abuse and different types of adult offending is consistent with a social learning theory explanation. Sexual abuse has extremely strong associations with sexual offenses, particularly sexual offenses against children, but it is only weakly associated with violent offenses that do not involve sexual activity. The fact that sexual offenses against children are most similar to sexually abusive behavior suggests a modeling explanation. These findings suggest that inmates are modeling specific types of behavior that they experienced in childhood.

Our examination of the effects of physical abuse on adult offending is also consistent with social learning theory and a modeling explanation. Inmates who have been physically abused as children are more likely to engage in homicide, assaultive violence, robbery, and sexual assaults targeting adults, but they are no more likely to engage in sexual assaults on children. The former almost always involves an overt physical attack, whereas the latter usually do not. In addition, physical abuse does not predict child molesting or statutory rape, which are nonviolent offenses. On the other hand, sexual assaults on adults, which typically involve both violence and sexual activity, are related to both physical and sexual abuse. Altogether, these results suggest that victims of sexual abuse are primarily modeling specific sexual behaviors, whereas victims of physical abuse are primarily modeling violent behavior.

Our evidence suggests that physically abused offenders learn a lesson about the use of violence generally. Physical abuse is just as strongly associated with robbery and sexual assaults on adults as it is with assaultive violence. It is no more strongly related to the offenders' assaultive violence against their children than other types of assaults. The effect is not restricted to violence during disputes or violence in discipline situations.

Attachment theory cannot explain the specialized effects we observe, as it would predict that different types of abuse have similar effects. In addition,

abuse was no more strongly related to homicide and assault than to other crimes. This evidence is not consistent with the idea that abused children develop a hostility bias that leads to later dispute-related violence (or angry aggression).

The evidence is also inconsistent with the hypothesis that the effect of abuse on adult offending is due to post-traumatic stress disorder. If abuse produced frustration then both sexual and physical abuse should have been more strongly associated with assaultive violence, according to a frustration-aggression approach. If abuse resulted in crime generally, we should not have observed any specialized effects. On the other hand, our data are consistent with the conclusion that emotional problems mediate a small portion of the effects of abuse on offending. However, it is also possible that offending mediates a small portion of the effects of abuse on emotional problems.

Differences in parental attachment and influence cannot explain the pattern of findings we observe. The effects of abuse depend on the type of abuse and the type of crime. We could not examine, however, whether attachment explains the effects of abuse on the likelihood of criminal offending, as all our respondents are offenders. It may very well be that attachment and influence or some other mechanism can explain this association. Future research must explore this issue. We could only examine whether attachment could explain the types of crimes offenders commit.

Our evidence for specialization is also consistent with social learning theory. We observe substantial relationships between type of prior offense and current offense. Offenders with a prior sexual offense are *much* more likely to commit a sexual offense than other offenses compared with those without this history. Offenders with a prior arrest for assaultive violence are more likely to commit assaultive violence, offenders with a prior robbery offense are more likely to commit robbery, and offenders with a prior nonviolent offense are more likely to commit a nonviolent offense.

These patterns point to individual differences between different types of offenders. Specialization is due to a special etiology, i.e., the variables that lead individuals to commit sexual offenses are *to some extent* different from the variables that lead to other crime. Our findings are consistent with other research showing that the determinants of sexual aggression are to some extent similar and to some extent different from the determinants of other antisocial behavior [e.g., Malamuth, 2003; Vega and Malamuth, 2007]. Our research suggests that the

experience of particular types of abuse may be one source of those differences.

We could not examine specialization in sexual offenses against children, as we did not have a measure of the victim's age for prior offenses. However, our finding that offenders with any type of prior nonsexual offenses are less likely to commit sexual offenses against youth supports this line of thinking. So does our finding that childhood sexual abuse is the best predictor of sexual offenses against children. Finally, past research shows that offenders who commit sexual offenses against children are more likely to specialize than those who sexually offend against adult women [e.g., Hall and Proctor, 1987; Lussier, 2005; Meithe et al., 2006].

Although sexual offenders are more likely to repeat their offense than other offenders, it is important to note that most of them do not repeat their offense. Over 90% of current sexual offenders have not been prosecuted for that offense before. Thus, our results do not justify harsh treatment of sexual offenders by the justice system because they are "persistent specialists" [Meithe et al., 2006]. However, we do not have information on offenses that were undetected, so we cannot adequately address this issue. Our method only allows us to compare relative levels of specialization, and it only applies to people who have been arrested for multiple offenses. Note that we have found the strongest effects for sexual offending even though one would expect more measurement error for these offenses than the violent offenses.

An obvious limitation of our study is that it is based on an inmate sample. Our sample only includes offenders who have been convicted of a serious crime. In addition, although our sample is nationally representative of state and federal inmates, it was selected from offenders who were already incarcerated, not those who are entering the system. As a result, it includes an overrepresentation of serious, chronic offenders with lengthy sentences [e.g., Silver et al., 2008]. Still, we cannot think of a compelling reason to question its generalizability to the general population. In addition, reliance on a sample of the general population is not practical when examining the effects of abuse on serious offenses. Even with an inmate sample, the percentage of offenders who commit sexual offenses against children is small.

Another limitation of our study is its reliance on retrospective self-reports of abuse. Respondents may not remember incidents, may vary in their interpretation of the questions, or may make false claims of abuse to excuse their behavior. Our

assumption is that biased reporting produces random measurement error and would not substantially alter the strong relationships we observe. In addition, the alternative measure of abuse—official data—has its own set of limitations. For example, much abuse is likely to go unreported to authorities. Child abuse is an inherently difficult variable to measure. However, we have argued that measurement issues are not as significant when using discriminant prediction, as one is interested in the relative strength of effects.

We must acknowledge, however, that measurement error is not necessarily random. An alternative explanation of our abuse findings is that different types of offenders prefer different types of excuses for their behavior. Perhaps sexual offenders prefer sexual abuse as an excuse, particularly those who target children, whereas violent offenders prefer to use physical abuse as an excuse. We think this is unlikely given that the survey was anonymous and given that the questions about abuse and current offense were asked in different sections. However, we cannot rule out the possibility that offenders are deceiving themselves in ways that produce these specific patterns.

Our study is also limited in that it is based on cross-sectional correlational data. It may be that some characteristic of the offender led them to have been abused in a particular way as a child and to commit similar offenses themselves as an adult. For example, children with violent tendencies may tend to elicit physical abuse and also commit violent offenses as an adult. Similarly, a child with a strong sexual drive or deviant sexual tendencies may be more likely to elicit sexual abuse and commit sexual offenses as an adult. Genetic similarities between family members and the child in sexual or violent tendencies could also explain the correlations if family members committed the abuse [DiLalla and Gottesman, 1991].

We argued that the method of discriminant prediction had advantages in addressing the issue of spuriousness. We do not need to worry that the relationship between general abuse and offending is spurious as we are finding more specific patterns. The strength of the coefficients and the fact that the patterns are so clear-cut also inspires confidence. In addition, our study controls for adult misbehavior as we study only offenders and control for their past offenses. The use of a sample of offenders rules out some alternative causal interpretations. Finally, the idea that children learn by imitation has been shown in experimental studies and is well established in the literature [Bandura, 1978]. It would be

surprising if children never imitated violent or sexual behavior.

In sum, our research emphasizes the importance of studying exactly *what* children learn when they observe a model. Knowing what children model helps us understand *why* they do so. Future research should examine different forms of child mistreatment and different outcomes in single designs. The method of discriminant prediction can then be used (along with other methods) to test different theoretical explanations of effects. This approach is particularly useful in the study of crime where the phenomenon of interest involves different but related behaviors.

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