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Crime & Delinquency 2007 53: 633
DOI: 10.1177/0011128706296466

Crime & Delinquency
Volume 53 Number 4
October 2007 633-656

10.1177/0011128706296466
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Recidivism of Supermax Prisoners in Washington State

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This study of recidivism among Washington supermax prisoners used a retrospective matched control design, matching supermax prisoners one-to-one with nonsupermax prisoners on mental illness status and up to eight recidivism predictors. Supermax prisoners committed new felonies at a higher rate than nonsupermax controls, but the difference was not statistically significant. Prisoners released directly from supermax to the community, however, showed significantly higher felony recidivism rates than their nonsupermax controls and committed new offenses sooner than supermax prisoners who left supermax 3 months or more before prison release. Limitations, methodological issues, and policy implications are considered.

Keywords: *recidivism; supermax; prisoners*

Since the early 1980s, most prison systems in the United States have built specially designed facilities, either stand-alone or connected to larger prisons, that keep selected inmates in lockdown status. This is a typical lockdown regime: Inmates are confined to single cells around the clock, leaving three times a week for showers and five times a week for solitary exercise in a small enclosed concrete yard; at these times, they are shackled and escorted by a pair of officers; commissary and property privileges are restricted; surveillance is continual; and on the very rare occasions when inmates are in the same room with another person—for example, when meeting with a review committee—they are caged or bolted down. Because this new form of maximum security is more intensive than previous versions, it is popularly described, perhaps with questionable logic, as "supermax."

Critics have collected evidence that a disproportionate number of supermax prisoners have problems coping with prison due to mental illness, brain damage, or other factors; that needed treatment is often not provided; and that vulnerable inmates are further damaged by sensory deprivation and other disorienting features of the environment (Cloyes, Lovell, Allen, & Rhodes, 2006; Grassian & Friedman, 1986; Haney, 1993, 2003; Harrington, 1997; Human Rights Watch, 1997, 2000; King, 1999; Pizarro & Stenius, 2004; Porter, 1998; Toch, 2001). For these reasons, the use of supermax has led to successful litigation in several jurisdictions (Collins, 2004), primarily focusing on inmates with mental illness and other psychological vulnerabilities (Jones'El v. Berge, 2001; Madrid v. Gomez, 1995). Interviews with staff and inmates described by Rhodes (2004) further suggest that some inmates become hardened or embittered in isolation, and some find the presence of others bewildering after they leave.

If extended isolation is as damaging as its critics claim, two kinds of issues are raised. First, there is the question of justice. The institution of supermax involves not merely the short-term isolation of offenders to cope with emergent situations, or as punishment for prison rule violations, but long-term preventive detention and deprivation of social contact. Human Rights Watch (2000, p. 1) has declared that "state and federal corrections departments are operating supermax facilities in ways that violate basic human rights." Litigation has been pursued in the hope—so far not realized—that courts would find the institution unconstitutional. The second issue is utilitarian. We may assume for the sake of argument that prison authorities have the

Authors' Note: This research was funded by a grant from the Intramural Research Funding Program in the School of Nursing, University of Washington, and also supported by the Washington Department of Corrections (DOC) through the University of Washington–Department of Corrections Mental Health Collaboration. The authors wish to acknowledge the assistance of Pam Mitchell, Associate Dean for Research, School of Nursing, for support and helpful suggestions in the development of this project. We are also grateful to Polly Phipps and colleagues at the Washington State Institute of Public Policy (WSIPP), and to Peggy Smith at the DOC Office of Planning and Research for providing data on study participants. For valuable insights on analysis of results, we are indebted to Elaine Thompson, Psychosocial and Community Health, and to Gregg Gagliardi of the Washington Institute for Mental Illness Research and Training. This article was improved as a result of suggestions by anonymous reviewers for *Crime & Delinquency*. Correspondence concerning this article should be sent to David Lovell, Department of Psychosocial and Community Health, University of Washington, Box 357263, Seattle, WA 98195-7263; phone: 206-543-3108; fax: 206-685-9551; e-mail: lovelld@u.washington.edu.

right to impose long-term confinement and social isolation when circumstances warrant it; but we must then weigh the institution's benefits to prison order against its costs. These costs include not only possible damage to the persons confined but also concerns about the behavior of supermax graduates when they return to general population prison settings or to the community.

In light of these issues, it is remarkable how little systematic research has been conducted on who gets assigned to supermax, how it affects them while they're there, whether it has any bearing on their later behavior, and whether such facilities actually reduce violence within prison systems (Kurki & Morris, 2001). Several recent additions to the literature have partially addressed this lack: A profile of Washington State supermax inmates indicates that supermax offenders show great diversity in criminal history and behavioral patterns (Lovell, Cloyes, Allen, & Rhodes, 2000); an analysis of violence trends in several prison systems (Briggs, Sundt, & Castellano, 2003) concluded that introduction of supermax facilities produced at best a temporary reduction in levels of prison disorder; and significant patterns of psychosocial impairment have been described in a sizeable random sample of Washington supermax residents (Cloyes, Lovell, Allen, & Rhodes, 2006). Ward and Werlich (2003), charging that supermax critics have relied on anecdotal accounts, cite low rates of return to the federal Marion and Alcatraz prisons to dispute concerns that prisoners behave more violently after supermax confinement. Mears and colleagues (Lawrence & Mears, 2004; Mears & Reisig, 2006; Mears & Watson, 2006) have undertaken thorough reviews of the issues involved in assessing the costs and benefits of supermax confinement, finding that the systematic empirical research needed for such an assessment has yet to be conducted.

As a partial remedy, we address here one of the utilitarian issues: whether recidivism in the community by released offenders is more likely if they were subjected to supermax confinement while in prison. Zamble and Quinsey (1997) provide evidence for a theory of recidivism that links it not only to individual propensities and environmental stressors but also to emotional and perceptual states. If, as critics claim, supermax confinement results in higher levels of paranoia and social anxiety, such processes may be sufficiently destabilizing that supermax offenders have a harder time getting their bearings during the first few months after release, when the risk of reoffense is highest. So we would expect them, on this theory, not only to reoffend at higher rates but also to reoffend more quickly than otherwise comparable offenders. Given these concerns, we designed our study to test the following hypotheses:

1. That offenders released from prison are more likely to commit new felonies if they have spent substantial portions of their prison terms in supermax;
2. That offenders released directly from supermax to society, without time to decompress in general population settings first, are more likely to commit new felonies after release; and
3. That offenders released to the community reoffend more quickly if they have been confined to supermax.

Method

Design

Comparative studies of outcomes between former prisoners who have and who have not spent much of their prison terms in supermax status cannot, of course, settle the causal question of the effect of lockdown on offenders. It is entirely plausible that prison staff and administrators, in making decisions about supermax assignment, are responding to features of the offender—for example, a hostile attitude toward authority and a willingness to engage in violence—that also predict future recidivism. The principal challenge to interpreting results in this study is posed by the obvious impossibility of controlling for such factors by randomly assigning prisoners to supermax units. Given the dearth of knowledge about supermax, however, we believed it important to determine whether supermax prisoners showed higher rates of recidivism than one would expect, based on standard age and criminal history predictors. To control for the influence of confounding variables, we used a retrospective matched control design in which supermax and nonsupermax offenders were matched on a set of eight predictors of recidivism other than supermax status. Selection of predictors was informed by the results of other studies and developed and tested by logistic regression techniques. Details of the matching are presented below, under Control Procedures.

Data Sources

This research project was approved by the University of Washington Institutional Review Board and the Washington Department of Corrections (DOC) Human Subjects Review Committee. Participants were drawn from offenders released from DOC facilities during the calendar years 1997 and 1998. This group included inmates who had spent time in Intensive

Management Units, Washington's label for supermax. We obtained data from two sources:

1. The DOC Office of Planning and Research provided data files from which we collected identifiers, age, ethnicity, sex, current offense, dates of incarceration and release, mental health data including diagnosis and status as seriously mentally ill (where available), level of care codes, days of residence in various prison residential mental health treatment units, infractions, and internal movements including dates of entry and exit from supermax.
2. The Washington State Institute for Public Policy (WSIPP), with the permission of the Office of the Administrator for the Courts, provided Washington criminal history and recidivism data on all offenders in the participant pool: offense types, dates, jurisdiction (juvenile, district, or superior courts), and disposition.

Data Compilation

Some members of the participant pool had several prison stays during the index years. We defined the index incarceration as the term from which they were first released during the index years, providing that it lasted 6 months or more. We used offender movement records to compile data on the total amount of time spent in supermax during the offender's entire DOC history and during the index incarceration, the number of supermax stays, the length of each stay, and the date of the last release from supermax before prison release.

To compile criminal history and recidivism data, we classified events as offenses only if they resulted in a conviction, counting one offense (the most serious) per offense date. We retrieved numbers of misdemeanors and felonies, dates of the first historical offense, dates and types of the first post-release offense, the most serious post-release offense, and numbers of felonies according to four principal types: drug felonies, property felonies (burglary and theft), sex offenses, and violent offenses (robbery, assault, homicide).

Identification of Participants

In Washington, supermax facilities are used in three ways. Depending on the prison and the circumstances, supermax facilities may be used for disciplinary segregation, for holding an offender while an incident or report is being investigated, or for long-term administrative segregation.

Disciplinary segregation is a time-limited sanction for a specific infraction, lasting up to 30 days. Short-term administrative segregation for investigative purposes can last up to 12 weeks before the prisoner must be returned to general population or assigned maximum custody. Under maximum custody status, an extended form of administrative segregation, prisoners are assigned to supermax for renewable 180-day periods. This status is officially not a punishment but a forward-looking measure to prevent violence against others, violence by others against the inmate, escape, or racketeering.

Because our interest lies in offenders judged sufficiently risky to be assigned maximum custody, we used the 12-week stay as our principal marker of supermax status. We narrowed the pool of 10,520 offenders released during the index years by removing those who had not served continuous prison terms of 6 months or more. Because the supermax program applies only to male inmates, we also eliminated all female inmates. Finally, we eliminated 1,059 male offenders (two thirds of all offenders identified as Hispanic) who were detained upon release by U.S. Immigration, leaving a potential participant pool of 7,248 men.

We classified as supermax participants all offenders whose last supermax date was less than 4 years before their release from prison and who had spent at least one continuous period of more than 12 weeks in supermax, or who had a series of shorter stays that added up to 40% of more of their prison term. This procedure yielded 200 supermax participants among men released from prison during the index release years, 1997 and 1998.

To provide a clear distinction between supermax and nonsupermax participants, we defined potential controls as male offenders who had no more than 30 days of supermax time in their Washington incarceration history, resulting in a control sample pool of 6,453 men.

Outcome Measures

For comparison of rates of reoffense, our principal outcome measure was commission of a new felony within 3 years after release from prison, as determined by a disposition of guilty. For comparisons of time to reoffense, we used both new felonies and new criminal offenses at any level (misdemeanor or felony). Arrests without convictions, as well as community supervision (e.g., parole) violations, were not counted as cases of recidivism.[1] For this study, only Washington State data were available. A previous study of mentally ill offenders (Lovell, Gagliardi, & Peterson, 2002) indicated that including out-of-state data would increase the felony rate by approximately 2%; whether supermax participants and controls would differ in rates of out-of-state offenses is unknown.

A major concern raised by supermax practices, and one motivation for this study, was that offenders released directly from supermax into the community might be too disoriented, jumpy, or hostile to cope with the challenges of society. Assuming some deterioration of social functioning, there is reason to believe that many coping skills can return fairly quickly after people emerge from isolation (Grassian and Friedman, 1986). We therefore defined a direct prison release variable, classifying as positive the 55 participants released directly from supermax into the community. To achieve a clear distinction between this group and supermax prisoners with time in normal prison settings before release, we defined a later release variable to cover participants with 90 days or more between supermax release and prison release; we excluded 19 supermax participants released from prison 2–80 days after leaving supermax, along with their mates. We tested the hypothesis that direct-release status is associated with greater recidivism by comparing the direct-release group both with their nonsupermax mates and with the later-release supermax group. Finally, we used life-table analysis to assess whether supermax status made a significant difference to time to reoffense after taking account of control variables.

Matching Procedures

Offenders assigned to supermax differ from other offenders in several respects that also predict higher recidivism, such as young age and extensive criminal history (Lovell, Cloyes, Allen, & Rhodes, 2000). From other studies (Barnoski & Aos, 1999; Beck, 1997; Gagliardi, Lovell, Peterson, & Jemelka, 2004; Gendreau, Little, & Goggin, 1996; Lovell, Gagliardi, & Peterson, 2002), and from exploratory analysis with our data set, we identified a set of variables that were significantly correlated with felony recidivism in our pool of released male offenders. For variables such as number of past felonies or age, relationships to recidivism are nonlinear: The precise number of felonies is not as important as whether one is a first-time, repeat, or chronically repetitive felony offender; nor is one's precise age as important as whether one is young, middle-aged, or old in relation to the overall offender population. So we recoded the continuous variables as ordinal variables with 2–4 values, selecting cut points to provide significant numbers of supermax participants in each category, as well as clear differences in average recidivism rates between categories.

Because we could not match on every potentially relevant characteristic, and some predictors (such as age of admission to prison and age of release) are correlated with each other, we used logistic regression and Receiver Operating Characteristic (ROC) analysis to identify an optimal set of control

variables, each of which made independently significant contributions to a prediction equation for felony recidivism (Tabachnick & Fidell, 2001). The area under the ROC curve (AUC) describes the extent to which a set of variables yields predictions better than chance (an AUC value of .50). Our eight-variable control set for felonies (Table 1) yielded an AUC value of .745, comparable to many well-established prediction instruments (Gagliardi, Lovell, Peterson, & Jemelka, 2004). As explained below, we used a special six-variable set for participants who met our criteria for probable mental illness; for this group, the control set showed very strong predictive power, with an AUC value of .840. Table 1 presents average scores (for continuously distributed variables) and rates (for categorical variables) of supermax participants, their nonsupermax mates, and the entire control pool.

Controlling for mental health status. Federal court precedents requiring medically necessary treatment for vulnerable inmates have led corrections systems to define a class of inmates labeled seriously mentally ill (SMI), i.e., those who are so impaired by a recognized mental disorder that the constitutional requirement applies. Our criteria were based on the widely accepted definition established by consent decree in the Ohio prison system, and recently adopted in Washington's DOC: "A substantial disorder of thought or mood which significantly impairs judgment, behavior, capacity to recognize reality or cope with the ordinary demands of life within the prison environment and is manifested by substantial pain or disability" (Ohio Department of Rehabilitation & Correction, 2000). The diagnostic component of classification as SMI can be met by a limited number of "qualifying" diagnoses, for example, schizophrenia, bipolar disorder, major depression, and organic brain disorder. Inmates diagnosed with substance abuse or sex offense–related disorders are covered only if they qualify independently on the narrower grounds of major mood or thought disorder with functional impairment.

The role of courts in establishing requirements for mental health treatment in prisons reflects the historical reality that mental health status has not been integral to correctional operations. In Washington, it has been part of DOC's electronic offender tracking system only since 1997. Because electronically recorded SMI status is not a completely reliable marker, we supplemented it with other indicators to identify inmates in our sample pool with *probable* serious mental illness:[2]

1. recorded status as SMI; or
2. two of the following: qualifying diagnosis, 30 or more days of residence in mental health living units, or level of care codes indicating need for regular psychotropic medication.

Table 1
Felony Recidivism Predictors for Supermax Participants, Matched Control Mates, and All Controls

Variable		Supermax (n = 200)	Mates (n = 200)	All Controls[a] (n = 6453)	p Supermax vs. All Controls
1. Past felonies (average)	+	5.14	4.92	4.05	.000
2. Past misdemeanors (average)	+	4.93	4.91	4.91	.95
3. First-time sex offender (percentage)	–	9	9	9	.927
4. Infraction rate > 1 per year (percentage)	+	93	91	40	.000
5. African American or Native American, Asian, Pacific Islander (percentage)[b]	+	35	32.5	30	.265
Non-mentally ill only					
6. Felony versatility (average, ordinal 1-4)[c]	+	1.85	1.86	1.70	.006
7. Index violent felony (percentage)[d]	–	55	49	39	.000
8. Age of release (average)	–	29.6	30.3	33	.000
Mentally ill only					
6. Mental health residential time (days, average)	–	450	417	169	.022

Note: The plus or minus signs indicate whether higher values (or positive values, for yes/no variables) were associated with increased or decreased rates of recidivism. "Mental health residential time" is the 6th variable in the prediction equation for mentally ill subjects only.

a. The "all controls" group excludes (from the male sample of 7,248) 200 supermax participants as well as 595 offenders with more than 30 days in supermax who didn't meet criteria for supermax status. Total SMI N = 428; non-SMI excluded from calculations for mental health residency variable.

b. African American 25–28%; other groups combined, 5–7%. Hispanic origin, an independent classification, played no predictive role after immigration detainees were removed from analysis.

c. Varies from 1 to 4 based on number of different major felony types (drug, property, sex, violent) in the offender's history.

d. "Index violent felony" rates were greater among supermax participants than among mates because it was not a prediction variable for offenders with mental illness, and there was a high rate of violent index felonies among the mentally ill subset of the supermax group. Index violent offense was negatively associated with felony recidivism in all groups.

Given the relatively low prevalence of inmates with mental illness in our pool, we judged that adding mental illness to other variables in a single matching process would unduly restrict our ability to match on other variables. We decided instead to conduct a separate matching procedure for offenders with mental illness. The mental illness matching variables are identified, along with the others, in Table 1; one of them, mental health residential time, was not part of the predictor set for non-SMI offenders. Consistent with the findings of Gagliardi, Lovell, Peterson, and Jemelka (2004), we found that residential mental health treatment for prisoners identified as mentally ill was associated with lower recidivism. Interestingly, residential mental health treatment was also correlated with time in supermax, confirming other observations about a subclass of prisoners with mental illness who are seen as unmanageable in general population settings and move back and forth between segregation and mental health units (Lovell, Cloyes, Allen, & Rhodes, 2000; Lovell, Johnson, Jemelka, Harris, & Allen, 2001; Lovell & Rhodes, 1997; Rhodes, 2004; Toch, 1982; Toch & Adams, 1986, 2002).

Rates of probable mental illness are substantially higher for supermax participants than for others in our sample pool (21% vs. 5.5%, $p < .001$), and mentally ill prisoners were over four times as likely as other prisoners to have been supermax participants. Improvements in documentation since 1997 mean that identification of offenders with mental illness in our release cohort is more likely for men who have subsequently returned to prison. This may explain why, in contrast to a previous study that used case-by-case archived chart reviews to identify SMI participants (Lovell, Gagliardi, & Peterson, 2002), we found that in the overall sample pool, offenders with probable mental illness were more likely than others to have committed new felonies (54% vs. 42%, $p = .000$). Because mental illness affects the behavior of offenders and the way they are managed both in prison and afterwards, it was important to separate this group during the control process; but, the confounding of recidivism with identification of mental illness means that no conclusions about the relationship between mental illness and recidivism should be drawn from this study.

Participants and mates. Applying a matched control design, we used the control variables to match supermax participants with controls and tested for differences in recidivism between supermax participants and their paired controls. We refer to "pairs" and "mates" to distinguish matched control participants from the broader pool of nonsupermax controls from which they were drawn. We were able to achieve a 1:1 match for almost every combination of control values. In five cases for non-mentally ill participants, and 12 cases for

mentally ill participants, there were no exact matches; mates with the next closest combination of control variable scores were selected, matching preferentially on the variables with the highest univariate correlations with felony recidivism. Where multiple matches per participant were available, mates were selected at random.[3] In a matched control design, the test (supermax) and control participants do not constitute independent groups, since control group members are picked to match the test participants. Each matched control pair (supermax participant and mate) may have one of four possible recidivism outcomes: (1) yes-yes, (2) yes-no, (3) no-yes, (4) no-no. The McNemar test assesses the strength and significance of differences in recidivism by comparing the number of yes-no outcomes to the number of no-yes outcomes.

Findings

Supermax Assignment and Felony Recidivism Rates

The overall 3-year felony recidivism rate in our cohort of men released from prison in 1997 and 1998 was 42%; paired controls showed a rate of 46%, and supermax participants 53%. As we continued our analysis, however, we discovered that recidivism of supermax participants was strongly associated with the timing of their release from prison. As shown in Table 2, later-release participants showed recidivism rates practically identical to their mates, but direct-release participants had much higher rates. In short, the difference between supermax participants and their nonsupermax mates was largely due to supermax participants released directly from supermax into the community when their prison sentences ended.

Because Table 2 displays striking differences in new felony rates between direct-release and other supermax prisoners, we investigated whether these supermax subgroups differed in other ways that might be associated with the difference in recidivism. Members of the direct-release group were younger at prison admission and release, committed their first offense at a younger age, had more past misdemeanors, and had much higher infraction rates. Prison admission and release age are highly correlated with age of first offense. Logistic regression and ROC analysis indicated that of the three, age of first offense provided better predictive power.[4] Within the supermax group, the combination of this variable with past misdemeanors provided strong predictive power (AUC = .753); the addition of infraction rates only added noise to the equation, slightly reducing

Table 2
Felony Recidivism of Supermax Participants Versus Nonsupermax Mates, by Prison Release Status of Supermax Participants ($N = 362$)

Release Status of Supermax Participants	Felony Recidivism			
	Supermax Participants		Nonsupermax Mates	
	Number	Percentage	Number	Percentage
All cases ($n = 181, 181$)[a]	96	53	83	46
Direct release from supermax ($n = 55, 55$)[b]	38	69	28	51
Later release ($n = 126, 126$)[c]	58	46	55	44

Note: Later-release participants had 3 or more months between supermax and prison release. Excluded from this and subsequent analyses are 19 supermax participants released from prison 2 to 80 days after leaving supermax, along with their mates.
a. Supermax participants versus mates: McNemar test, $\chi^2 = 2.215$, $p = .069$, one-sided; odds ratio = 1.5.
b. Supermax participants versus mates: McNemar test, $\chi^2 = 4.5$, $p = .016$, one-sided; odds ratio = 3.5.
c. Supermax participants versus mates: McNemar test, $\chi^2 = .085$, $p = .39$, one-sided; odds ratio = 1.14.

predictive accuracy. The relationships between criminal history, infraction rates, and recidivism—critical to interpreting results in this study—are considered in more detail below.

We paired direct-release supermax participants with later-release supermax participants (> 90 days between supermax and prison release) on the two distinguishing variables—age of first offense and past misdemeanors—recoded, respectively, into variables with 3 and 4 ordinal values. When we matched direct- and later-release supermax offenders on these characteristics, we found that 69% of the direct-release group committed new felonies, versus 53% of their later-release mates. The odds of recidivism versus nonrecidivism for direct-release offenders were nearly twice the odds for their later-release mates; given the low numbers involved, however, the imbalance was not statistically significant. We also used the same pairs of direct- and later-release supermax participants to assess differences in community survival before the first new offense (Table 3).

In summary, supermax status was significantly associated with higher rates of recidivism only for those supermax offenders released directly

from supermax to the community. These offenders were far more likely to reoffend than their nonsupermax mates; they also reoffended more than later-release supermax offenders matched with them, although at a level short of statistical significance.

Direct Release Status and Time to Reoffense

We suggested above that if supermax has a debilitating effect on offenders' coping abilities after release, we would find not only higher rates but also a shorter time to reoffense among supermax inmates. Because we found significantly higher rates of recidivism only for supermax inmates released directly to the community, we focused on time to reoffense for this group. To test whether direct-release status makes a significant difference to time to reoffense, we used Kaplan-Meier Life-Table Analysis, which takes account for participants who lasted through the entire follow-up period.[5] For descriptive purposes, we also compiled cumulative rates of reoffense over four intervals in the post-release period: 3 months, 6 months, 1 year, and 3 years (Table 3). Uneven intervals were used because recidivism survival curves decline less rapidly as time goes by, beginning to level off after 2 years.

Because the matching variables for the supermax versus nonsupermax groups were based on prediction of new felonies, survival patterns for the comparison of the direct-release group to their nonsupermax mates are shown only for felony recidivism. Median survival—the time it took half of the participants to commit their first new felony—was estimated at 12 months for direct-release participants and 27 months for their nonsupermax mates as well as for their later-release supermax mates.

For survival comparisons within the supermax group, we used any new criminal offense (misdemeanor or felony) as an outcome measure, as well as new felonies. We were able to use the broader measure for this comparison because the two variables on which we matched the direct-release and later-release supermax groups for the felony recidivism outcome—past misdemeanors and age of first offense—were also strongly and significantly associated with any new offense. Life-Table Analysis indicated that direct-release status was also strongly associated with a shorter time to any new offense, with median survival estimated at 14 weeks versus 8 months for their later-release mates. Furthermore, it appears that most of the direct-release supermax participants who committed their first new felony after 1 year in the community must have committed other new offenses earlier.

Table 3
Timing of First New Offense by Direct-Release Supermax Participants, Nonsupermax Mates, and Later-Release Supermax Mates ($N = 55$ per group, matched)

	Cumulative Rates					
	Felony			Any New Offense		
Interval	# Nonsupermax (%)	# Later-Release Supermax (%)	# Direct-Release Supermax (%)	# Later-Release Supermax (%)	# Direct-Release Supermax (%)	
3 months	6 (11%)	5 (9%)	12 (22%)	12 (22%)	23 (42%)	
6 months	10 (18%)	14 (25%)	22 (40%)	23 (42%)	33 (60%)	
12months	14 (25%)	22 (40%)	26 (47%)	31 (56%)	40 (73%)	
3 years[a]	28 (51%)	29 (53%)	38 (69%)	39 (71%)	45 (82%)	
Median survival[b]	27 months	27 months	12 months	8 months	14 weeks	

Note: Nonsupermax mates omitted from Any New Offense comparisons because they were not matched with supermax participants on predictors of this outcome.

a. Direct- versus later-release felony recidivism: McNemar, $\chi^2 = 2.55$, $p = .069$, odds ratio = 1.9.

b. Kaplan-Meier test for equality of survival distributions: felony, direct-release supermax versus nonsupermax mates: $\chi^2 = 5.4$, $p = .01$, one-sided; felony, direct-release versus later-release supermax mates: $\chi^2 = 3.77$, $p = .026$, one-sided; any new crime, direct-release versus later-release supermax mates: $\chi^2 = 3.75$, $p = .027$, one-sided.

Criminal History, Infractions, and Recidivism

Supermax assignment is first and foremost a response to prison misbehavior, so we did not expect to succeed in closely matching supermax and nonsupermax offenders on infraction rates without sacrificing our ability to match on a number of more highly predictive criminal history and age-related variables. Instead we used as a control the categorical variable, high versus low infraction rate, setting one infraction per year as the cutoff (Table 1; Gagliardi, Lovell, Peterson, & Jemelka, 2004). This strategy appeared reasonable because, after age-related and criminal history variables are included, the categorical infractions variable makes a greater contribution than the continuous one to felony recidivism prediction ($\chi^2 = 36.5$ vs. 28.6). A more precise recoding of infraction rates, however, shows that recidivism continues to climb with higher levels of infractions: from 46% for offenders with one to two infractions per year to 62% for those with more than six per year. Furthermore, annual infraction rates varied greatly among the three groups critical to our findings: direct-release supermax participants, their nonsupermax mates, and their later-release supermax mates (Table 4).

Despite these observations, logistic regression analysis indicated that, once criminal history is included, group membership—direct-release supermax versus later-release supermax versus nonsupermax—consistently outperforms infraction rates in predicting recidivism. The simplest of these analyses is presented in Table 5, which shows results of a logistic regression equation for felony recidivism within the set of 362 supermax participants and their mates. As we have seen, the direct-release supermax subgroup is distinguished from other members of this set by high numbers of past misdemeanors and low age at first offense. Nevertheless, even when these variables are included as predictors, membership in the direct-release supermax group still makes a significant further contribution to predicting recidivism; infraction rate does not.

These results can partly be attributed to the association between variations in infraction rates and criminal history, especially within supermax participants ($r = .347$ for entire pool, $r = .456$ for supermax participants, $p = .000$). Of course, how offenders behave in prison is not entirely predictable on the basis of criminal history; but there is no straightforward relationship between the residual differences in behavior and recidivism. Later-release supermax participants and their nonsupermax mates, matched by criminal history, showed comparable rates of recidivism; yet the

Table 4
Annual Infraction and Felony Recidivism Rates in Three Criminal History-Matched Groups ($N = 55$ per group)

	Mean Infraction Rates		
Group	All	Recidivists	Nonrecidivists
Direct-release supermax	14.3	14.1	14.8
Nonsupermax mates	3.2	3.4	3
Later-release supermax	6.5	8.8	4

Table 5
Logistic Regression Equation for Felony Recidivism Among Supermax Participants and Mates ($N = 362$)

Equation Variables	*B*	*SE*	Wald[a]	*p*	Odds Ratio[b]
Intercept	−.888	.661	1.807	.179	.411
Previous misdemeanors**	.558	.114	24.095	.000	1.748
Age of first offense*	−.040	.018	5.079	.024	.961
Infraction rate	.094	.143	.438	.508	1.099
Direct-release supermax*	.782	.358	4.768	.029	2.185

Note: To account for nonlinear relationships—using the form of the predictor with the strongest relationship to recidivism—and to provide a more intuitive interpretation of statistics, two of the continuous variables were recoded as ordinal variables: previous misdemeanors scored 1-4 (0-2, 3-4, 5-8, 9 or more); infraction rate scored 1-4 (0-0.999, 1-1.999, 2-5.999, 6 or more). Age of first offense was not recoded because, within this high-risk sample in which 70% had committed their first offense by age 20 and 80% by 25, the continuous variable showed a stronger relationship to recidivism. Analyses using alternative logistic regression procedures (stepwise, sequential) or alternative methods of coding variables yielded variations on these statistics, but in no case did infraction rate make a significant contribution.

a. The Wald statistic is generated by the slope coefficient (*B*) and the standard error (*SE*), and has a chi-square distribution that is used to test the significance of the predictive relationship.

b. The estimated odds ratio, adjusted for other variables in the model, represents the change in the odds of being in the recidivist versus the nonrecidivist group with each increment in the value of the prediction variable.

*$p < .05$. **$p < .01$.

supermax group's average infraction rate of 5.6 significantly exceeded the rate of 2.4 in their nonsupermax mates (paired samples *t*-test, $p = .000$). Furthermore, in two of the three critical test groups (direct-release supermax and their nonsupermax mates, Table 4), recidivists and nonrecidivists

showed approximately the same infraction rates. In summary, after criminal history was controlled, group membership provided more predictive power than infraction rates because infraction rates did not consistently predict between-group comparisons of recidivism, and furthermore did not consistently discriminate recidivists from nonrecidivists within groups.

Time in Supermax

We set out to test the relationship between felony recidivism and two categorical independent variables: supermax status and direct release from supermax to the community. Significant and robust associations were found only for direct release from supermax. Would the use of a continuous variable, time in supermax during the index incarceration, show a stronger relationship between supermax assignment and felony recidivism? In the total participant offender pool of 7,248 men released from prison, we found no significant association between felony recidivism and time in supermax (Pearson's $r = .017$, $p = .145$). Suspecting that any relationship between time in supermax and recidivism would be nonlinear, we recoded the continuous supermax time variable into an ordinal variable. Here we found a significant but very weak correlation ($r = .036$, $p = .002$). Using sequential logistic regression to account first for the effect of our eight control variables, however, we found that the recoded variable made no significant further contribution to the likelihood of recidivism ($\chi^2 = 2.38$, $df = 1$, $p = .123$).[6] Because we obtained the same results whether we recoded time in supermax into variables with 3, 5, or 7 ordinal values, we conclude that amount of time in supermax makes no significant independent contribution to felony recidivism.

Within the supermax group, both felony recidivists and nonrecidivists averaged approximately 1 year in supermax, with a minimum of 3 months and a median time of not quite 10 months. Furthermore, both direct-release and later-release supermax offenders had the same average, minimum, and median amounts of supermax time. It appears, therefore, that for released offenders who had been assigned supermax status while in prison, subsequent recidivism was primarily associated not with the amount of supermax time, but with direct release from supermax into the community.

Discussion

The principal finding of this study is that supermax assignment did make a significant difference to recidivism, but only for those offenders who were

held in supermax until the end of their prison sentences. These offenders committed new felonies sooner and at higher rates than otherwise comparable nonsupermax offenders. Furthermore, they reoffended more quickly than otherwise comparable supermax offenders who weren't released to the community directly from supermax.

Two different processes could be responsible for these results:

1. Supermax confinement may induce perceptual and emotional states, such as paranoia and social anxiety, that make it more difficult to cope with the demands of society. Evidently, many inmates can recover their equilibrium if they spend time in social prison settings before release.
2. The reason that some offenders are kept in supermax right up to the day of their release is that they are more combative, antisocial, or impulsive than others; it is not surprising that such men would show higher recidivism.

No inference to a causal explanation of our findings can be solid in the absence of random assignment of offenders to different custody and release conditions. Yet we consider the first explanation plausible and the second, while also plausible, probably incomplete. The similarity in recidivism outcomes between later-release supermax participants and their mates suggests that our control procedures were generally effective in containing the effect of preexisting differences between supermax and nonsupermax offenders. Second, the scope for alternative explanations is narrowed because we found significant differences in two directions: not only between direct-release supermax participants and their nonsupermax mates but also between direct- and later-release supermax participants. The first explanation is further strengthened by the fact that direct-release inmates reoffended more quickly, and finally by the finding that the direct-release factor was more significant and robust than the amount of time spent in supermax.

The most likely alternative explanation is that when prison staff respond to misbehavior by assigning prisoners to supermax, and especially by keeping them there until the end of their prison sentences, they are responding to the same traits—for example, an antisocial disposition—that lead offenders to reoffend after they are released. Taking infraction rates as an indicator of the underlying, causally efficacious disposition, the case for this alternative explanation is bolstered by the correspondence between recidivism and levels of infracting, as well as by the very high infraction rates in the critical group: offenders released directly from supermax to the community. This particular alternative, however, does not appear to provide a complete explanation of our findings. Much of the variance in infraction

rates is attributable to the criminal history variables for which we controlled and comparisons of infraction rates when criminal history is controlled cannot consistently account for either between-group or within-group comparisons of recidivism.

It stands to reason that some offenders have been inclined to break the law for a long time and that they continue to do so while in prison and afterwards; it further makes sense that such people would be overrepresented in supermax populations. But it's highly likely that in addition to these factors, the experience of supermax confinement until release makes a contribution. In Washington, the group of men "at war with the system" is far from comprising the whole population of prisoners in supermax (Lovell, Cloyes, Allen, & Rhodes, 2000). Other patterns included men quietly paying the price for involvement in prison rackets; prisoners with mental illness who moved back and forth between supermax and residential mental health; prisoners who coped less and less successfully with prison as time went on; and young, impulsive prisoners who, seemingly oblivious to consequences, persistently antagonized staff and other prisoners no matter where they lived. While any of these patterns can lead staff to retain offenders in supermax, not all are equally relevant to risk of offense, either in prison or afterwards. The supermax institution is rationalized as a means of preventing serious violence in general population settings; but for many staff, the decision to send someone to supermax, or to keep him there, is more a reactive than a preventive or predictive judgment, often proceeding from a feeling that they have no other means of responding appropriately to prisoners who keep on misbehaving (Rhodes, 2004). It is important also to bear in mind that custody-level decisions have historically been made with a view only to consequences within prison walls; our results suggest the need also to consider what happens after men leave.

It was not surprising to find higher recidivism among prisoners retained in supermax until release to the community; but we did not expect that setting this group aside would leave no significant difference in recidivism between matched supermax and nonsupermax offenders. Nor did we expect to find no significant association between recidivism and the amount of time inmates spent in supermax, once control variables were taken into account. Interpretation of these negative findings must consider how well a Washington study represents supermax nationwide. Washington is by no means typical of state prison systems; few other organizations would have supported this study, nor the detailed examination of supermax life provided by Rhodes (2004). With respect to treatment of offenders with mental illness, as well as conditions of confinement in supermax, it is possible that

harsher conditions in other states may result in higher rates of subsequent recidivism among supermax prisoners, regardless of the timing of their release from prison. Nevertheless, this study provides little support for the hypothesis that the likelihood of recidivism is exacerbated by supermax assignment by itself. Opponents of the supermax institution, therefore, may prefer to use arguments other than recidivism in support of their position.

The plausibility of interpreting our results in terms of the supermax experience is strengthened by arguments that alternative interpretations cannot completely account for them (Cook & Campbell, 1979); but our results don't so much settle the question as establish findings to be explained by a different kind of study. These findings show the need for a longitudinal analysis, based on narrative data, of what prisoners do and how they are treated through various stages: presupermax, supermax custody, postsupermax prison life, and the transition to society.[7] Were those held in supermax until prison release considered more dangerous than other offenders, or did they simply continue to misbehave despite the sanctions imposed on them? What were the differences in attitudes, social support, and postrelease supervision between offenders who coped well and those who rapidly failed after prison release? Given that we cannot address such questions by manipulating conditions, a longitudinal, qualitatively rich study is required to allow assessment of the effect of keeping prisoners in solitary confinement until prison release.

In assessing the implications of our findings and the inevitable limitations due to the impossibility of a controlled experiment with supermax assignment, we must remember the policy context. In some states, many prisoners are assigned to supermax because of imputed gang membership, and are required to "debrief" before they can leave (Palumbo, Hepburn, Griffin, Fischer, & Janisch, 2000). As depicted in the documentary *Concrete and Sunshine* (Cousino, 2002), the fear of being labeled a snitch provides a powerful disincentive for cooperating. In other cases, men may seem to comply by implicating other offenders with minimal gang involvement, who consequently have no useful information that would gain them release from supermax (Kupers, personal communication, cited by Toch, 2006). In either event, such policies are likely to limit the number of supermax prisoners with a chance to recover in general population before release from prison. We submit that our study provides evidence against the practice of retaining prisoners in supermax until release that is far stronger than any evidence yet provided of its benefits.

If we were using post-hoc controls to establish the efficacy of a previously untested treatment, the methodological objection to our study would appear serious indeed. But the previously untested treatment, with efficacy yet to be

demonstrated, is not something we're trying to prove in this study; rather, it is the supermax institution itself. Perhaps we have failed to test all possible reasons for the robust association we found between recidivism and keeping people in supermax until the end of their sentences. In the absence of evidence for the benefits of the practice, however, the best way to test whether retaining people in supermax is indeed responsible for an increased risk to society is to change the policy and see whether that intervention reduces the risk. The factors that explain our findings should engage further research efforts; meanwhile, if direct-release supermax inmates are twice as likely as other supermax inmates to reoffend during the 1st months after release, aren't we ethically required to develop some other intervention, besides keeping them in supermax, to reduce the danger they pose?

Notes

1. The exclusion of arrests, supervision violations, and "noncriminal" misdemeanors (traffic infractions, public intoxication, driving while intoxicated) as outcome measures reflects our judgment, based on 8 years of compiling criminal history data from various sources, that criminal convictions provide the most reliable measure of behavior when supervision practices and procedures for recording arrests vary over time and between localities. For studies of recidivism within a single city or county, when offenders are subject to the same conditions of postrelease supervision, or variations in conditions are known, arrests and supervision violations may provide a more sensitive indicator of behavior than felony convictions. Because these conditions do not apply to our sample, using arrests or supervision violations as a measure of behavior would leave open the question, whose behavior is being measured? (For this comment, we thank Polly Phipps, previously at the Washington State Institute for Public Policy and now at the Bureau of Labor Statistics.)

2. This electronic seriously mentally ill (SMI) algorithm was compared to the results of a systematic survey of mental illness in Washington prisons (Lovell, 2003). In the survey dataset, the algorithm identified 1,740 offenders as SMI, compared to 1,630 identified as SMI in the survey by a combination of electronic data, medication records, chart reviews, and staff interviews. Of the 1,740, there were 333 false positives, and 223 of the 1,630 identified in the survey were missed by the algorithm. Cloyes, Lovell, Allen, and Rhodes (2006) use factor analysis to confirm the convergence of these indicators on an underlying mental illness construct.

3. Details on matching procedures are available in an Appendix, upon request.

4. In the male prison-release cohort, age of release is highly correlated (.796) with age of first offense; although the former was a more robust predictor for our recidivism comparisons, age of first offense is a well-established recidivism predictor. In a recent study of recidivism among mentally ill offenders in Washington, which included the beneficiaries of a new community transition program (Lovell, Gagliardi, & Phipps, 2005), Gagliardi's analysis shows that previous misdemeanors, by itself, predicts recidivism as accurately as the widely used Level of Services Inventory-Revised (LSI-R). Because only 126 later-release supermax controls were available to match against the 55 direct-release supermax participants, there were 6 pairs (out of 55) with inexact matches on the two ordinally recoded control variables. Excluding problem cases from the analysis, however, made no difference to the strength or significance of the association.

5. Cox regression and Kaplan-Meier survival analysis are procedures for describing how long participants survive (in this case, live in the community) before an event of interest occurs (in this case, reoffense) and assessing whether particular variables have a significant effect on survival. Both procedures include as part of the calculation those participants who lasted through the entire follow-up period without reoffending. When rates of reoffense differ significantly between groups, comparing time to reoffense only for participants who reoffended would yield a misleading comparison of how long members of the different groups lasted without reoffending. Cox regression for survival analysis is a more sophisticated procedure, because it allows controlling for the effect of various variables on survival. Kaplan-Meier analysis provides a chi-square test for the equality of survival distributions between groups in experimental designs. This procedure was used here because it provides more intuitive results (e.g., comparisons of median and average survival periods) and seemed appropriate because we had controlled for differences by matched control methods. Similar significance levels are provided by Cox regression, using supermax status and immediate release status as covariates.

6. In sequential logistic regression, a set of covariates is entered to assess the extent to which an equation applying these variables predicts the binary outcome—in this case, recidivism—then a second regression is performed adding the variable of interest—in this case, an ordinal variable representing time in supermax—to determine whether, after an equation using the first block of predictors is calculated, the additional variable makes any further contribution to predicting recidivism.

7. Toch and Adams (2002) describe a large-scale study of this kind conducted before the widespread use of supermax.

References

Barnoski, R., & Aos, S. (1999). *Presentation to the standards and ranges committee, sentencing guidelines commission*. Olympia, WA: Washington State Institute for Public Policy.

Beck, A. (1997). *Recidivism of prisoners released in 1983*. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics.

Briggs, C., Sundt, J., & Castellano, T. (2003). The effect of supermaximum security prisons on aggregate levels of institutional violence. *Criminology, 41*(4): 1341-1376.

Cloyes, K., Lovell, D., Allen, D., & Rhodes, L. (2006). Assessment of psychosocial impairment in a supermaximum security unit sample. *Criminal Justice and Behavior, 33*(6), 760-781.

Collins, W. (2004). *Supermax prisons and the constitution: Liability concerns in the extended control unit*. Washington, DC: National Institute of Corrections.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design & analysis issues for field settings.* Boston: Houghton Mifflin.

Cousino, N. (Producer/Writer/Director). (2002). *Concrete and sunshine* [Motion picture]. (Available from Nicole Cousino, 1660 Ithaca Street, Chula Vista, CA 91913)

Gagliardi, G., Lovell, D., Peterson, P., & Jemelka, R. (2004). Forecasting recidivism in mentally ill offenders released from prison. *Law & Human Behavior, 28*(2), 133-155.

Gendreau, P., Little, T., & Goggin, C. (1996). A meta-analysis of the predictors of adult offender recidivism: What works! *Criminology, 34,* 575-607.

Grassian, S., & Friedman, N. (1986). Effects of sensory deprivation in psychiatric seclusion and solitary confinement. *International Journal of Law and Psychiatry, 8,* 49-65.

Haney, C. (1993). Infamous punishment: The psychological consequences of isolation. *National Prison Project Journal, Spring 1993,* 3-7, 21.

Haney, C. (2003). Mental health issues in long-term solitary and "supermax" confinement. *Crime and Delinquency, 49*(1): 124-156.

Harrington, D. (1997). Caging the crazy: "Supermax" confinement under attack. *The Humanist, Jan/Feb,* 14-19.

Human Rights Watch. (1997). *Cold storage: Super-maximum security confinement in Indiana*. New York: Author.

Human Rights Watch. (2000). *Out of sight: Super-maximum security confinement in the United States*. New York: Author.

Jones'El v. Berge, 164 F.Supp.2d 1096 (W.D. Wis 2001).

King, R. (1999). The rise and rise of supermax: An American solution in search of a problem? *Punishment and Society, 1,* 163-186.

Kurki, L., & Morris, N. (2001). The purposes, practices, and problems of supermax prisons. *Crime and Justice, 28*, 385-424.

Lawrence, S., & Mears, D. (2004). *Benefit-cost analysis of supermax prisons: Critical steps and considerations*. Washington, DC: The Urban Institute.

Lovell, D. (2003). Identification of offenders with serious mental illness in Washington department of corrections facilities. Olympia, WA: Department of Corrections.

Lovell, D., Cloyes, K., Allen, D., & Rhodes, L. (2000). Who lives in super-maximum custody? A Washington State study. *Federal Probation, 64*(2): 33-38.

Lovell, D., Gagliardi, G., & Peterson, P. (2002). What happens to mentally ill offenders released from prison? Findings from Washington's Community Transitions Study. *Psychiatric Services, 53*(10), 1290-1296.

Lovell, D., Gagliardi, G., & Phipps, P. (2005). *Washington's dangerous mentally ill offender law: Was community safety increased?* Olympia, WA: Washington State Institute for Public Policy.

Lovell, D., Johnson, D., Jemelka, R., Harris, V., & Allen, D. (2001). Living in prison after residential mental health treatment: A program follow-up. *The Prison Journal,* 81(4), 497-514.

Lovell, D., & Rhodes, L. (1997, September). Mobile consultation: Crossing correctional boundaries to cope with disturbed offenders. *Federal Probation, 41*(3), 40-45.

Madrid v. Gomez, 889 F.Supp.1146 (N.D. Cal 1995).

Mears, D. P., & Reisig, M. (2006). Theory and practice of supermax prisons. *Punishment & Society, 8*(1), 33-57.

Mears, D. P., & Watson, J. (2006). Towards a fair and balanced assessment of supermax prisons. *Justice Quarterly, 23*(2), 232-270.

Ohio Department of Rehabilitation & Correction, Bureau of Mental Health Services. (2000). Policy 319-11. Columbus, OH: Author.

Palumbo, D., Hepburn, J., Griffin, M., Fischer, D., and Janisch, R. (2000). Taking back the yards: Controlling and managing prison gangs. Paper presented at the American Society of Criminology, San Francisco, CA.

Pizarro, J., & Stenius, V. (2004). Supermax prisons: Their rise, current practices, and effect on inmates. *The Prison Journal, 84*(2), 248-264.

Porter, B. (1998, November 8). Is solitary confinement driving Charlie Chase crazy? *New York Times Magazine*, 52-58.

Rhodes, L. (2004). *Total confinement: Madness and reason in maximum security*. Berkeley, CA: University of California Press.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.
Toch, H. (1982, fall). The disturbed disruptive inmate: Where does the bus stop? *Journal of Psychiatry and Law*, 327-349.
Toch, H. (2001). The future of supermax confinement. *The Prison Journal, 81*(3), 376-88.
Toch, H. (2006). *Sequestering gang members, burning witches, and observing due process.* Unpublished manuscript.
Toch, H., & Adams, K. (1986). Pathology and disruptiveness among prison inmates. *Journal of Research in Crime and Delinquency, 23*, 7-21.
Toch, H., & Adams, K. (2002). *Acting out: Maladaptation in prisons*. Washington, DC: American Psychological Association.
Ward, A., & Werlich, T. (2003). Alcatraz and Marion: Evaluating super-maximum custody. *Punishment and Society, 5*, 53-75.
Zamble, E., & Quinsey, V.L. (1997). *The criminal recidivism process*. Cambridge, MA: Cambridge University Press.

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