

Felony and Violent Recidivism Among Supermax Prison Inmates in Washington State: A Pilot Study

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Executive Summary

Purpose

Since the early 1980's, most prison systems have built specially designed facilities that keep selected offenders in lockdown status for lengthy periods of time, sometimes years, on the grounds that they pose a danger to the prison community. There have been several successful court challenges to some aspects of these practices, for example confinement of psychologically vulnerable inmates in such facilities, but there is scarcely any systematic research on who gets assigned to supermax, how it affects them while they're there, whether such facilities actually reduce violence within prison systems, and whether it has any bearing on their later behavior.

This study compares recidivism in the community by released offenders who were and who were not subjected to substantial periods of supermax confinement while in prison. Specifically, we ask:

1. Whether supermax assignment is associated with the probability, seriousness, or timing of new offenses.
2. Whether the probability, timing, and seriousness of new offenses is associated with (a) the amount of time offenders spend in supermax environments or (b) the length of the interval between transfer out of supermax and release to the community.

Methods

The subject pool comprised all offenders released from DOC facilities during the index years 1997 and 1998.

- The Department of Corrections provided data on demographics and correctional behavior, including mental illness indicators, infractions, and assignment to supermax facilities: Intensive Management Units (IMUs).
- The Washington State Institute for Public Policy provided criminal history and post-release offense data.

Files were compiled into a format suitable for analysis. In the 8,000-member male offender pool, there were 242 IMU subjects, who had spent at least three continuous months in IMU (most of them much longer); they were individually matched with non-IMU controls on eight felony recidivism predictors, recoded where necessary into categorical or ordinal variables:

- | | |
|---------------------------------|--------------------------------------|
| • Past felonies | • Past misdemeanors |
| • Felony versatility | • Age of first offense |
| • First-time sex offender (Y/N) | • Past drug felonies |
| • Past violent felonies | • White or Minority Group (2 values) |

Though only slightly correlated with recidivism, ethnicity was included as a control variable because of the salience of racial identification in prisons and particularly in gang membership issues that affect assignment to IMU. A separate matching procedure was conducted for subjects with mental illness, matching them with mentally ill controls on the first 5 control variables.

- There were 21% of IMU subjects with strong indicators of serious mental illness (SMI), vs. 5% of non-IMU pool members.
- In each group (IMU subjects and controls), there were 52 SMI members, 190 non-SMI.

Felony recidivism was defined as the commission of a new felony within three years of release, for which the offender was adjudicated guilty. Person offense recidivism was defined as commission, followed by conviction, of a misdemeanor assault or a felony offense against persons (robbery, assault, sex offenses, homicide).

Results

IMU Group Membership. IMU group members, non-IMU group members, and the entire offender pool are compared below on felony offense and new person offenses:

Outcome	IMU	Controls	All Men
New Felony	47%	40%	38%
New Person Offense**	36%	24%	21%

- These results are not significant for felony recidivism ($p=.1$); though significant for new person offenses ($p=.004$), IMU subjects and controls were not matched on several significant predictors of new person offenses.

When subjects were partitioned into SMI and non-SMI subgroups, IMU assignment was significantly associated with felony recidivism among non-SMI offenders:

- Non-SMI felony recidivism: IMU=47%, controls=38%; $\chi^2=3.12$, $p=.048$ 1-tailed

Among felony recidivists, IMU subjects committed more serious offenses than controls:

- Violent felonies:
 - Among IMU recidivists, 54%
 - Among non-IMU recidivists, 39%
 - $\chi^2=5.98$ $df=2$, $p=.05$, 1-tailed

Cox regression results indicated that group membership was not significantly associated with the hazard of committing a new felony, i.e., with how long offenders lasted in the community before reoffending; but it was significantly associated with the hazard of committing a new person offense: $\chi^2=7.72$, $p=.005$.

Length of Time in IMU. Among IMU group members, both felony recidivists and felony non-recidivists averaged approximately 1 year of time in IMU during the index

incarceration. Length of time in IMU also had no bearing on seriousness of new offenses or timing of new offenses.

Interval Between IMU Release and Prison Release. This study was stimulated by a concern about whether releasing offenders directly from IMU into the community, without any intervening period in normal prison settings to readjust to the presence of others, was associated with a higher risk of recidivism. Of the IMU group, there were 59 members released to the community immediately after release from IMU.

- New felonies: Immediate prison release group: 64%
 Other IMU group members: 41%
 $\chi^2=9.8$, $df=1$, $p=.001$, odds ratio=2.6
- This prediction effect remained significant when statistical controls were introduced for other variables associated with immediate prison release: age at first offense, number of past misdemeanors.

Implications

The findings reported above pose two related but distinct problems of interpretation:

- The problem of statistical prediction. Where we found that IMU assignment or timing of release predicted recidivism, are these robust findings? Would they survive if different methods were used, or further statistical controls were introduced?
- The problem of causal interpretation. If there are robust statistical relationships between recidivism and IMU assignment or timing of IMU release, to what extent can these relationships be attributed to the effect of the IMU experience, rather than to some unmeasured and uncontrolled disposition in the offender—for example, psychopathy—that both provokes IMU assignment and leads to further criminal aggression.

These questions define the terrain for future research, involving both further analysis of the data collected for this pilot study and collection of additional information. With additional data, more sophisticated statistical techniques may allow us to assess whether our findings bear up when appropriate controls are introduced.

Infraction rates and SMI status are important factors for further investigation. When did infractions occur (before, during, or after IMU assignment) and how serious were they? If SMI offenders signed to IMU posed no greater risk of recidivism than non-IMU SMI offenders, what were the differences that led prison staff to assign them to IMU?

In the absence of random assignment, which for obvious reasons must be ruled out in IMU studies, threats to validity will always remain. Attempts to get at causal explanation through collection of further data and longitudinal analysis of cases will narrow the range of alternative explanations that may be considered true to life. Our findings about the apparent effects of immediate prison release, and the role of mental illness, support policy concerns that are more than academic.

INTRODUCTION

Since the early 1980's, most prison systems have built specially designed facilities—either stand-alone or inside larger prisons—to 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; 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.

Critics of supermax confinement have collected evidence that a disproportionate number of super-maximum custody prisoners have problems coping with prison due to mental illness, brain damage, or other factors; that needed treatment is not provided; and that vulnerable inmates are further damaged by sensory deprivation and other disorienting features of the environment. Some studies of inmates in isolation indicate that even those who start out healthy can become withdrawn, incapable of initiating or governing behavior, suicidal, or paranoid (Grassian & Friedman, 1986; Haney, 1993, 2003). For these reasons, the use of super-maximum confinement has led to successful litigation in several jurisdictions (*Jones'El v. Berge*, 2001; *Madrid v. Gomez*, 1995).

Defenders of supermax continue to claim that evidence of its damaging effects is partial, anecdotal, or limited to a few states that have successfully been sued. This defense is possible because whether a person's rights are being violated by conditions of confinement, and whether those conditions produce unwanted outcomes, are distinct though related questions. The first concerns what is happening now, to individuals, and reports accepted by courts are entirely appropriate for this purpose. The second question concerns how classes of persons will fare over time, and requires methods that standardize observations and compare factors across individuals. The relationship between the questions is twofold. That someone is suffering now provides reason to fear about his future welfare and behavior, though it doesn't settle the matter. More important, that a practice causes suffering now—assuming it can be justified at all—provides reason to require that it lead to outcomes we value, such as safer prisons or communities, and that it be limited to prisoners for whom it is clearly necessary.

It is therefore 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; two exceptions are Lovell, Cloyes, Allen & Rhodes, 2000, and Briggs & Sundt, submitted). Nor has any count of supermax inmates nationwide been conducted since King (1999), whose estimate of 20,000 inmates in 36 states as of 1996 must seriously understate the current scope of the practice. In this report, we begin to address one research gap by comparing recidivism in the community

by released offenders who were and who were not subjected to substantial periods of supermax confinement while in prison. Specifically, we ask:

1. Whether supermax assignment is associated with the probability, seriousness, or timing of new offenses.
2. Whether the probability, timing, and seriousness of new offenses is associated with (a) the amount of time offenders spend in supermax environments or (b) the length of the interval between transfer out of supermax and release to the community.

METHODS

Data Sources

The subject pool comprised all offenders released from DOC facilities during the index years: calendar years 1997 and 1998. The Office of Planning and Research, Department of Corrections (DOC), provided three data files:

1. Principal offender file: 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, and days of residence in various prison residential mental health treatment units. This file contained one record per incarceration per offender, i.e., offenders released several times during the index years had multiple records.
2. Infractions file: offender ID, dates, infractions types, and sanctions, one record per event.
3. Movement file: offender ID, dates, location codes, movement type codes, and movement reason codes. There was one record per event, with sending and receiving treated as separate events; furthermore, whether a field corresponded to the sending or receiving location depended on the movement type codes. These records covered the entire history of the offender, including terms that ended before or began after the index years.

The Washington State Institute for Public Policy (WSIPP) with the permission of the Office of the Administrator for the Courts, provided Washington criminal history data on all offenders in the subject pool: offense types, dates, jurisdiction (juvenile, district or superior courts), and disposition.

Data Compilation

Organization of DOC records into files capable of analysis proved the most arduous task of the study. Omitting details (Appendix A), we used offender movement data to complete or correct admission and release dates in the principal offender file. From this file we also retrieved the total amount of time spent in intensive management units

(IMU)—Washington’s name for its supermax facilities—during the offender’s entire DOC history and during the index incarceration, the number of IMU stays, the length of each stay, and the date of the last release from IMU 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). Recidivism included all supervision violations, misdemeanors, and felonies occurring three years or less after the index release.

Identification of Subjects

From the 10,520 offenders released during the index years, we removed those who had not served continuous prison terms of six months or more. Since the intensive management program officially applies only to male inmates, we also eliminated all female inmates, leaving a potential subject pool of 8,307 offenders.

Not every prisoner who spends time in IMU qualifies as an IMU subject. Depending on the prison and the circumstances, these facilities may be used to store an offender safely who presents an acute problem, to hold offenders serving short terms of disciplinary segregation (as opposed to long-term preventive detention, the stated purpose of intensive management), or to isolate an offender while an incident or report is being investigated (which can last up to 12 weeks before he must be returned to general population or assigned intensive management status). Once assigned intensive management status, offenders normally stay 180 days in IMU before being considered for release to general population, but are occasionally released earlier. To maximize statistical power, we classified as IMU subjects all offenders who had spent at least one continuous period of more than 12 weeks in IMU or who had shorter stays that added up to 40% or more of their prison term. This procedure yielded 242 IMU subjects among men released from prison.

Control Procedures

Post-Hoc Controls. Our previous study (Lovell et al., 2000) showed that offenders assigned to IMU differ from other offenders in several respects that also predict higher recidivism, such as young age and extensive criminal history. To limit the confounding influence of these variables, we matched IMU subjects with non-IMU controls on the major variables that predicted recidivism. Multivariate regression techniques are also available that facilitate statistical controlling for possible confounding influences on recidivism. In a pool of 8,307 cases, however, we found that IMU group membership, applying to only 242 subjects, made no contribution to a logistic regression recidivism

equation, despite the fact IMU group members had substantially higher rates of recidivism than others in the pool. We therefore decided to stay with the matching strategy for the first stage of analysis. Potential controls were male offenders who had no more than 30 days of IMU time during their index incarceration (30 days is the limit for disciplinary segregation).

We recognize, of course, that unmeasured factors may predispose some prisoners both to IMU assignment and to later recidivism; for this reason, significant results using a post-hoc control group do not necessarily warrant any particular causal interpretation. Given the dearth of knowledge about supermax, however, we believed it important to determine whether IMU subjects had higher rates of recidivism than one would expect, based on standard age and criminal history predictors.

From other studies (Barnoski & Aos, 1999; Beck, 1997; Gendreau, Little & Goggin, 1996) and our past research on mentally ill prisoners, we identified a set of eight variables that were significantly correlated with felony recidivism in our pool of 8,307 released male offenders, and which made independent contributions to logistic regression felony recidivism prediction equations (Table 1). Continuing analysis of predictor sets from our previous studies of recidivism among mentally ill offenders (Lovell, Gagliardi & Peterson, 2002) showed that very little predictive power is lost when continuous variables are recoded into ordinal or categorical variables, for both mathematical and theoretical reasons: equation coefficients are better behaved if variable ranges are roughly equivalent; and the difference in proclivity for crime between a man of 35 and a man of 25 is far more significant than the difference between 35 and 50 or even 60. Limiting the range of potential values for the variables allows matching on a greater number of variables. So we recoded the continuous variables as ordinal variables with 2-4 values, selecting cut points to provide clear differences in average rates for each ordinal value and significant numbers of IMU offenders in each category. Breakdowns are presented in Appendix A.

Using these strategies, we were able to achieve a 1:1 match for almost every combination of eight predictor values; as explained below, a separate matching process on 5 variables was conducted for IMU subjects with mental illness. In 5 cases for non-mentally ill subjects, and 6 cases for mentally ill subjects, there were no exact matches and controls from the next closest combination of predictor scores were selected. Where multiple matching controls per subject were available, controls were selected at random. Table 1 presents average scores (for continuously distributed variables) and rates (for categorical variables) of IMU subjects, controls, and the entire released male offender pool. There was wide variability in most of the continuous variables, and a small number of offenders with values at the extreme high end tended to raise average values above the median and cause high standard deviations. In some cases, therefore, average values differ between IMU subjects and controls despite equal numbers of cases in each ordinal category of the variable.

Table 1
Comparisons of Eight Felony Recidivism Predictors Among IMU Subjects (N=242),
Controls (N=242), and All Male Offenders Released in 1997 and 1998 (N=8,307)*

Variable	IMU	Controls	All Males	p IMU vs. Cntrl
+ Past felonies (avg)	4.69	4.53	3.90	.607
+ Past misdemeanors (avg)	4.26	4.30	4.45	.945
+ Felony Versatility (avg, ordinal 1-4)	1.79	1.82	1.68	.732 ^a
- Age of First Offense (avg)	19.6	20.3	23.58	.308 ^b
- First-Time Sex Offender (pct)	10%	9%	9%	.876
+ Past Drug Felonies (avg)	.55	.60	0.98	.593
+ Past Violent Felonies (avg)	1.15	1.12	0.66	.753
+ African American or Other Minority (pct) ^c	34%	31%	29%	.438

*Variables are listed in the order of their univariate correlations with felony recidivism. The plus or minus signs indicate whether higher values (or positive values, in the case of yes/no variables) were associated with increased or decreased rates of recidivism.

- a. p value based on chi-square comparison of distributions across 4 ordinal categories (1-4), reflecting the number of different major felony types (drug, property, sex, violent) in the offender's history.
- b. p value for comparison of distributions across 4 ordinal categories (<19 yrs old, 19 thru 25, 26 thru 35, and >35) = .943.
- c. Ethnicity has a relatively low correlation with felony recidivism (.114) but was included as a control variable because of the salience of racial identification in prisons and particularly in the issues (e.g., gang membership) that affect assignment to IMU.

Controlling for Mental Health Status. Mental health status is not integral to correctional operations, and has been incorporated into DOC's electronic classification system only since 1997. 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 functionally impaired by a recognized mental disorder that the constitutional requirement applies. Because no completely reliable method is available for inspecting electronic databases and identifying offenders with mental illness, we used a conservative combination of indicators to identify inmates in our sample pool with *probable* serious mental illness:

1. recorded status as SMI; or
2. two of the following:
 - a. qualifying diagnosis;
 - b. 30 days residential mental health unit residency;
 - c. level of care codes indicating need for regular psychotropic medication

Improvements in documentation since 1997 mean that identification of offenders with mental illness in our release cohort is more likely for men who have returned to prison. This may explain why, in contrast to our previous study which used case-by-case archived chart reviews to identify SMI subjects (Lovell et al., 2002), we found that in the overall sample pool, offenders with mental illness were much more likely than others to have committed new felonies (48% vs. 37%). Regardless of the general relationship between mental illness and recidivism, mental health status is a major issue in the use of supermax assignment. Table 2 shows that rates of probable mental illness are substantially higher for IMU subjects than for others in our sample pool (21% vs. 5%), and that mentally ill prisoners were over 5 times as likely as other prisoners to have been IMU subjects.

Table 2
Mental Illness and IMU Status Among Men Released from Washington Prisons in 1997 and 1998 (N=8,307)*

		Probable Mental Illness		Total
		Yes	No	
IMU Status	Yes	52	190	242
	No	390	7675	8065
	Total	442	7865	8307

* $\chi^2=129.3$, $df=1$, $p=.000$, odds ratio=5.39

Knowing that IMU offenders had a disproportionate rate of serious mental illness, reviewers of our proposal warned us that mental illness might interact with IMU assignment and affect our results. 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, using only the first 5 variables in Table 1 to accommodate the lower number of available matches. As our recidivism results will show, controlling for mental illness proved a wise precaution.

Dependent and Independent Variables

Our principal outcome measure was commission of a new felony within three years after release from prison, as determined by a disposition of guilty. For this phase of the study, only Washington state data were available to us. Our previous study of mentally ill offenders (Lovell et al., 2002) indicated that consideration of out-of-state data would increase the felony rate by approximately 2%; whether IMU subjects and controls would differ in rates of out-of-state offense is unknown. We used chi-square techniques to test

whether IMU group membership was associated with higher felony recidivism. We also wanted to test whether IMU group membership was associated with more serious new crimes and shorter survival times in the community before committing new offenses.

In addition to the fundamental question about differences in recidivism rates according to group membership, we were concerned with two other possible independent variables: the amount of time the offender had spent inside IMU, and the length of the interval between release from IMU and release from prison. In particular, observers concerned about supermax have wondered whether inmates released directly from such facilities to the community would be more likely to commit new offenses. Whether total IMU time and time between IMU and prison release were associated with recidivism outcomes (yes/no, seriousness, and timing) were tested within the 242-member IMU group.

RESULTS

Profile of Subjects, Controls, and All Men Released from Prison

Table 3
Index Offenses of IMU Subjects (N=242), Controls (N=242), and
All Men Released from Washington Prisons in 1997 and 1998 (N=8,307)

Index Felony	IMU Subjects		Controls		All Males	
Unclassified	16	7%	20	8%	516	6%
Drug	39	16%	44	18%	2871	35%
Property	51	21%	54	22%	1912	23%
Robbery & Assault	85	35%	85	35%	1846	22%
Sex Offenses	36	15%	29	12%	911	11%
Homicide	15	6%	10	4%	219	3%

Table 3 shows that IMU subjects and controls resembled each other in index offenses, but that both groups had substantially lower rates of index drug offenses and higher rates of index violent offenses—especially robbery and assault—than the entire male release cohort. As Table 1 indicated, study subjects were younger and had more extensive criminal histories than other male prisoners in the release cohort. IMU subjects and controls were similar to each other and to the overall release cohort in ethnic breakdown: 68% white, 24% African-American, and 9% Native American or Pacific Islander. There were 66 subjects (13%) with Hispanic origin.

In a previous study of recidivism among mentally ill offenders (Lovell et al., 2002), we found that new violent felonies were extremely rare (10%); among subjects in this study, they were more common (100 cases, 21%), but still too few to provide sufficient power for equations predicting violence. As in the previous study, therefore, we added

misdemeanor assaults to commonly recognized felony offenses against persons (1st degree arson, 1st degree burglary, robbery, assault, kidnapping, sex offenses, and homicide) to create the dependent variable, *new offense against persons* (person offense). Principal recidivism outcomes are displayed in Table 4.

Table 4
Rates of Felony and Person Offense Recidivism for IMU Subjects (N=242), Controls (N=242), and All Men Released from Washington Prisons in 1997 and 1998 (N=8,307)

Outcome	IMU	Controls	All Men
New Felony	47%	40%	38%
New Person Offense**	36%	24%	21%

Note: Felony recidivism, IMU vs. controls: $\chi^2=1.89$, $df=1$, $p=.1$, 1-tailed

** New person offense, IMU vs. controls, $\chi^2=7.7$, $df=1$, $p=.004$, 1-tailed

IMU Group Membership

Rates of Felony Recidivism. Although IMU Group members had a higher rate of felony recidivism than controls, this difference fell short of statistical significance (Table 4). While exploring our data, however, we noticed an unexpected interaction between serious mental illness, IMU group membership, and felony recidivism. These relationships are displayed in Table 5, which partitions the cross-tabulation of felony recidivism by IMU group into SMI and non-SMI subjects.

There is a significant association between IMU status and recidivism for 380 non-SMI subjects, and no relationship for SMI subjects. While the association between mental health status and felony recidivism was almost significant for IMU subjects, it was highly insignificant for controls. In short, there is a suggested association between SMI status and recidivism, but only for non-IMU offenders; and our hypothesis that IMU status is associated with recidivism is confirmed, but only for non-SMI offenders.

Table 5
Relationships Among SMI Status, IMU Status, and Felony Recidivism (N=242)*

SMI Status		IMU Status		Totals	
		Yes	No		
Yes	New Felony	Yes	24 46%	26 50%	50 48%
		No	28 54%	26 50%	54 52%
	Totals	52	52	104	
No	New Felony	Yes	89 47%	72 38%	161 42%
		No	101 53%	118 62%	219 58%
	Totals	190	190	380	

*Percentages are rates of new felonies (yes or no) for each IMU and SMI status.

IMU status and recidivism: for probable SMI $\chi^2=.154$, $df=1$, $p=.422$ 1-tailed
 for non-SMI, $\chi^2=3.12$, $df=1$, $p=.048$ 1-tailed¹

SMI status and recidivism: for IMU group, $\chi^2=.008$, $df=1$, $p=.528$ 1-tailed
 for controls, $\chi^2=2.45$, $df=1$, $p=.079$ 1-tailed

Seriousness of New Crimes. As demonstrated in Table 4, IMU subjects were far more likely than controls to commit new person offenses. Looking only at felonies, the distribution of the most serious new felonies committed by recidivists in the IMU subject and control groups is displayed in Table 6. We combined the few “other” felonies with property felonies, and 3 new sex offenses and 1 new homicide (committed by an IMU group member) were added to the far more frequent robberies and assaults in the violent felony category. Clearly, IMU recidivists committed more serious—i.e., violent—new felonies than control recidivists did.

¹ A similar pattern applies to the other outcome of interest, new person offenses (distributions not shown): for SMI offenders, new person offenses by IMU status, $\chi^2=.370$, $df=1$, $p=.343$ 1-tailed; for non-SMI, new person offenses by IMU status, $\chi^2=8.2$, $p=.003$ 1-tailed.

Table 6
Types of Most Serious New Crimes Committed by Felony Recidivists
in the IMU Group (N=113) and Control Group (N=98)*

		IMU Status		Total
		Yes	No	
New Felony Type	Drug	17 15%	24 24%	41 19%
	Property	34 30%	36 37%	70 33%
	Violent	62 54%	38 39%	100 47%
Total		113	98	211

* Percentages represent the share of each crime type among the most serious new felonies committed by group members; $\chi^2=5.98$ $df=2$, $p=.05$, 1-tailed

Confounding Variables. Although IMU subjects and controls, by design, resembled each other closely with respect to eight felony recidivism predictors, IMU subjects differed from controls and from the entire male release cohort with respect to several variables that predict new person offenses. Also, despite roughly similar breakdowns of index crime types, the particular offenses of IMU subjects must have been more serious. They entered prison on the index conviction at an earlier age than controls, served longer terms, and were released at approximately the same age. (In the entire release cohort, age of admission and age of release were highly correlated at .975, but the latter worked better in logistic recidivism prediction equations.) Table 7 presents means of several uncontrolled variables of interest for both IMU subjects and controls, along with univariate correlations of these variables with felony and person offense recidivism in the entire male release cohort.

The three major statistical differences between IMU members and controls are index violent offense (which governs the length of the index prison term), annual infraction rate, and age of admission.

- Having a violent index crime is negatively correlated with felony recidivism in all groups (release cohort, SMI, not SMI, IMU, not IMU), and not correlated with future violence.
- Annual infraction rates ranged from 0 to 73 with a mean of 1.5, a median of .64, and a standard deviation of 2.99. Given this skewed distribution and wide variation, outliers may drive up the average rate for IMU subjects.

- Looking at age of admission, 60% of IMU subjects were 25 or younger when admitted to prison on the index term, vs. 46% of controls and 36% of all men in the release cohort. In this case, a few older inmates in the IMU group may have dampened the differences in group means.

Table 7
Mean Values of Uncontrolled Variables for IMU Subjects (N=242), Controls (N=242), and All Men Released from Washington Prisons in 1997 and 1998 (N=8,307), and Correlations with Felony and Person Offense Recidivism

Variable	<u>Mean Values</u>			<u>Recidivism Correlations</u>	
	IMU	Controls	All Men	Felony	Violence
Index Violent Offense (pct)	59%	53%	38%	-.168	.008
Current Prison Term (mos.)**	56	29	25	-.103	-.072
Annual Infraction Rate**	8.2	1.6	1.3	.119	.154
Age of Release	30	30	32	-.112	-.149
Age of Admission**	26	28	30	-.093	-.138

Timing of New Offenses. Among recidivists, the average time to the first new offense of any type was 8 months for subjects, 7 months for controls ($p=.23$); for both groups, the average time to the first new felony was 9 months, and to the first new person offense, 10 months. In short, group membership played no role in timing of new offenses among recidivists. Cox regression techniques reflect the hazard of re-offending over the entire post-release period and take account of subjects who survived without re-offending. Using this more sophisticated test, group membership had no significant association with the hazard of committing any new offense or of committing a new felony, but was significantly associated with the hazard of new person offenses ($\chi^2=7.72$, $df=1$, $p=.005$). Statistical controls for the influence of other variables, which in the case of matched samples require special techniques beyond standard logistic regression methods (e.g., Kleinbaum, 1994), were not applied at this stage of inquiry.

The felony survival curve (Figure 1) displayed a familiar logarithmic pattern, with most failures occurring within 9 months and the failure curve beginning to level off around two years after release.

Amount of Time in IMU

Table 8 displays the proportions of IMU subjects with varying lengths of time in IMU. Felony recidivists and non-recidivists were similar: about 1 year in IMU during the index incarceration. This variable also had no bearing on the seriousness or timing of new

offenses. Neither taking previous incarcerations into account, nor partitioning IMU time into ordinal categories, made any difference to the finding that for the class of IMU regulars, almost all of whom had spent long periods of time in this environment, the amount of IMU time bore no relationship to community outcomes.

**Figure 1. Community Survival Until First Felony:
All Subjects (N=484)**

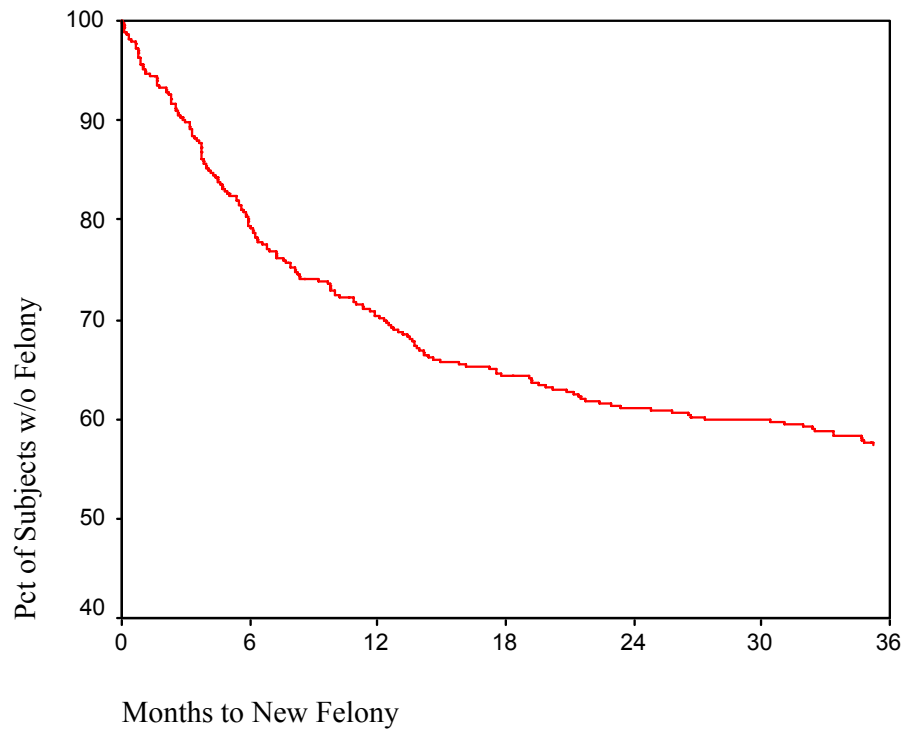


Table 8. Amounts of IMU Time for IMU Subjects (N=242)

IMU Time	Number	Percent
6 months or less	65	27%
6 months to 1 year	70	29%
1 to 3 years	92	38%
Over 3 years	15	6%

Timing of Release from IMU

A major concern raised by IMU practices, and one motivation for this study, was that offenders released directly from IMU into the community would 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 emerging from isolation (Grassian and Friedman, 1986). We found that the time between subjects' release from IMU and their release into the community (Time to Release) was correlated with felony recidivism, new person offenses, and length of survival in the community before committing new offenses. But if the real issue is immediate release to the community, using the continuous Time to Release variable may ignore that marker, while giving unwarranted weight to the 50 long-term prison inmates with more than three years (ranging up to twelve years) between IMU and prison release. We therefore defined an Immediate Prison Release variable, classifying as positive the 59 subjects released directly from IMU into the community. When entered into logistic regression equations, Immediate Prison Release showed more robust associations with outcomes than Time to Release did. Results are displayed in Tables 9 and 10.

Table 9
Immediate Prison Release and Felony Recidivism Among IMU Subjects (N=242)*

		Immediate Prison Release		Total
		Yes	No	
New Felony	Yes	38 64%	75 41%	113 47%
	No	21 36%	108 58%	129 53%
Total		59	183	242

* Percentages are rates of new felonies (yes or no)

$\chi^2=9.8$, $df=1$, $p=.001$ 1-tailed, new felony odds ratio for immediate yes vs. no =2.6

Table 10
Immediate Prison Release and Person Offense Recidivism
Among IMU Subjects (N=242)*

		Immediate Prison Release		Total
		Yes	No	
New Person Offense	Yes	30 51%	57 31%	87 36%
	No	29 49%	126 69%	155 64%
Total		59	183	242

- Percentages are rates of new person offense (yes or no)
 $\chi^2=7.5$, $df=1$, $p=.005$ 1-tailed, person offense odds ratio=2.3

On average, members of the immediate prison release group were younger than the others at prison admission and release, committed their first offense at a younger age, and had more previous misdemeanors. Stepwise logistic regression selected the last two for a significant prediction model. We then controlled for age of first offense and number of previous misdemeanors, and found that immediate prison release still made a significant independent contribution to prediction of felony recidivism ($\chi^2=4.382$, $df=1$, $p=.036$), but not to new crimes against persons ($\chi^2=3.086$, $df=1$, $p=.079$).

Membership in the immediate prison release group was also associated with shorter time to new offenses. But age at first offense, previous misdemeanors, and (for new felonies) status as a first-time sex offender were also significantly associated with the timing of new offenses. As Table 11 indicates, controlling for these variables in Cox regression equations suppressed the effect of immediate prison release on timing of new felonies and new crimes against persons, i.e., the addition of immediate prison release to the equation did not significantly increase the likelihood of correctly predicting hazard; but a significant relationship persisted between immediate prison release and the timing of any new offense (i.e., any kind of new felony or misdemeanor).

Table 11
Cox Regression Results on Timing of New Offenses with Addition of Immediate Prison Release to Control Variables*

Outcome	Results w Control Vbls			Change w Prison Release Vbl		
	χ^2	df	p	χ^2	df	p
Any New Offense	107.9	2	.000	4.805	1	.028
New Felony	70.9	3	.000	3.262	1	.071
New Person Offense	50.6	2	.000	2.684	1	.101

* Age at first offense: higher age, decreased hazard;
 Previous misdemeanors: higher number, increased hazard;
 For new felonies only, status as a first-time sex offender: decreased hazard

DISCUSSION

Summary of Findings

We recap here the research questions stated in the Introduction:

1. Whether supermax assignment is associated with the probability, seriousness, or timing of new offenses.
2. Whether the probability, timing, and seriousness of new offenses is associated with (a) the amount of time offenders spend in supermax environments or (b) the length of the interval between transfer out of supermax and release to the community.

We thus have three independent variables: group membership, time in IMU, and interval between transfer out of IMU and release to the community; and three dependent variables: probability, seriousness, and timing of new offenses. Table 12 displays a matrix of results, with a + or an X indicating significant associations, and 0 no association. Associations are assigned an X rather than a + if they apply to some groups and not others (e.g., non-SMI vs. SMI) or if differences between groups pose difficulties of interpretation.

Table 12
Matrix of Findings

		Dependent Recidivism Variable		
		New Felony	Seriousness	Timing
Independent IMU Variable	IMU Group Y/N	X ^a	X ^b	X ^c
	Time in IMU	O	O	O
	Timing of IMU Release	+	X ^b	X ^d

- a. Applies only to Non-SMI offenders.
- b. Differences between groups pose difficulties of interpretation.
- c. Applies to new crimes against persons but not to other recidivism measures.
- d. With statistical controls in place, applies to any new offense regardless of type, but not to new felonies or new crimes against persons.

Two Problems of Interpretation. The findings reported above pose two related but distinct problems of interpretation:

- The problem of statistical prediction. Where we found that IMU assignment or timing of release predicted recidivism, are these robust findings? Would they survive if different methods were used, or further statistical controls were introduced?
- The problem of causal interpretation. If there are robust statistical relationships between recidivism and IMU assignment or timing of IMU release, to what extent can these relationships be attributed to the effect of the IMU experience?

These questions define the terrain for future research, involving both further analysis of the data collected for this pilot study and collection of additional information.

Methods of Further Analysis

Perhaps the first step in further analysis is to subject the data to systematic diagnostic tests to ensure that the methods used so far are appropriate. Selection of variables for multivariate regression equations in this pilot study has been guided by tables of univariate correlations among the independent and dependent variables of interest. Further diagnostics should be applied, however, to measure collinearity among groups of variables, assess interaction effects, and identify outliers.

Using logistic regression on the entire pool of 8,307 men released from prison, we found that IMU group membership, applying to only 242 subjects, made no contribution to a prediction equation, despite the fact that IMU group members had substantially higher

rates of recidivism than others in the pool. To prevent the large size of the pool from swamping the predictive effect of IMU assignment, we could take repeated random samples of 250 offenders from the non-IMU pool and apply logistic regression to the combined sample. Assuming that IMU assignment often predicted recidivism in these mini-studies, meta-analysis could be applied to the results to determine how robust this finding is. Separate runs could be conducted with SMI and non-SMI offenders to assess whether the predictive power of IMU assignment depends on mental health status. If these procedures replicate the significant predictive effects found with the matching strategy, our confidence would be strengthened in the conclusion that IMU assignment is independently associated with a higher likelihood of recidivism.

Additional methods would be required to assess the role of measured but uncontrolled differences between the IMU and non-IMU groups, such as index violent offense, age at release, length of prison term, age at admission, and infraction rates. Using standard logistic regression to control for these variables is not appropriate with matched samples, but logistic methods especially designed for matched samples (Kleinbaum, 1994, Chapter 8) may be used to test whether the relationship persists if we enter additional uncontrolled differences between groups into the equations. Whether and how to control for infraction rates by this technique, however, raises the issue of causal interpretation. Infractions are potent measures of inmate behavior and of how staff view the inmate, and consequently are highly associated with IMU assignment. Controlling for infraction rate, therefore, may render insignificant the independent statistical contribution of IMU assignment to recidivism outcome. Does this mean that infraction rate, rather than IMU assignment, actually “explains” recidivism outcomes? Why then do infraction rates show such a weak relationship with recidivism among the population of men released from prison? These questions require closer examination of the processes at work in prisons, a task for which further statistical manipulation of existing data may not suffice.

Propensity matching is an alternative strategy, which comes closer to replicating random assignment than either multivariate regression or matching on outcome predictors (Barnoski & Aos, 2003). In propensity matching, logistic regression is used to build equations that predict membership in the “experimental” group, i.e., IMU assignment, and the control group is selected by matching subjects on the resulting propensity scores. Propensity matching is worth a trial with the data developed for this study. Assuming some degree of rationality in the IMU assignment process, however, it is likely that infraction rate—for reasons mentioned above—will prove to be an indispensable propensity variable, and that controls with matching scores on the resulting propensity equations will be too scarce to support the analysis.

Taking the concept of propensity matching a step further, we could attempt to identify instrumental variables, i.e., variables that predict assignment to IMU but not recidivism outcomes (Wooldridge, 2003, ch. 15). Controls could be identified by matching scores on equations that successfully predict IMU assignment using only such instrumental

variables. We don't consider it likely that such variables will emerge in the aggregate IMU sample data. Nevertheless, this strategy is worth exploring; particularly because our principal finding, that SMI status interacts with IMU assignment in predictions of recidivism, may be interpreted as revealing that SMI offenders have been assigned to IMU for reasons that have nothing to do with their risk of recidivism.

Factors for Further Investigation

In the preceding discussion, two variables—mental illness and infraction rates—have loomed large as sources of complexity in interpretation of findings. Our previous research (Lovell et al., 2000) revealed a diversity of patterns among inmates assigned to IMU, and it is likely that the mental illness and infraction rate variables themselves reflect multiple factors that further investigation may bring to light.

We mentioned in the Methods section that ascription of probable mental illness was based on a conservative application of available OBTS indicators, which were likely to have preferentially identified recidivists. These indicators are also clinically impoverished, providing little information about differences between men who were and men who were not assigned to IMU. What were the clinical or behavioral factors that provoked IMU assignment but evidently had little bearing on behavior after release from prison? Examination of archived medical files, along with case management narratives available through OBTS, may allow us to distinguish relevant syndromes among subjects classified as mentally ill and bring us a step closer to describing causes.

Together with living unit assignments (e.g., IMU or segregation vs. general population), and loss of good time, infractions are reliable indicators of how successfully an inmate is coping with prison—at least from the staff's point of view. But when did the infractions occur and how serious were they? Inmates can continue to accumulate infractions while in IMU, but the physical setting is designed to foreclose the possibility of serious assault. Our data permit a sequential ordering of infractions and IMU residency, and together with narrative case management records may provide more specific indications of reasons for placing or retaining subjects in IMU. This information, in turn, may shed further light on factors underlying the various recidivism patterns of IMU subjects and help us understand why variables such as age at first offense and number of previous misdemeanors would be associated with release directly from IMU into the community.

In the absence of random assignment, which for obvious reasons must be ruled out in IMU studies, threats to validity will always remain. Attempts to get at causal explanation through collection of further data and longitudinal analysis of cases will enhance interpretability in two ways. First, the application of further methods to a richer data set may result in additional findings. Second, additional qualitative detail about longitudinal patterns among IMU and non-IMU offenders will indicate which explanatory hypotheses are true to life. Accumulation of statistical findings and qualitative evidence may narrow

the scope for interpretation and thereby address threats to validity inherent in non-experimental designs.

Significance of Preliminary Findings

We have described lines of further inquiry suggested by the results of this pilot study. In this concluding section, we argue that the preliminary results are robust and important enough to make such inquiry worthwhile, not only for the investigators but for agencies to which external funding requests will be directed.

Timing of IMU Release. We found, as suspected, that IMU group members released directly from IMU into the community had significantly higher rates of felony recidivism than those who had some prerelease period in social prison settings:

IMU Group Membership. For interpreting the contribution of IMU group membership to prediction of recidivism, the principal threat to validity lies in the possibility that a special form of behavior (1) elicits the judgment that an inmate is dangerous while in custody, provoking IMU assignment; and (2) predicts recidivism. Some students of criminality would suggest an underlying personality structure, psychopathy, to explain the relationship. We can rule out the fantastic hypothesis that IMU-provoking behavior predicts *lower* recidivism. Our study proposal laid out three possible findings and their interpretive implications:

1. A finding that IMU assignment predicted *lower* recidivism would suggest that IMU confinement is an effective treatment. Our findings do not support this hypothesis.
2. A finding that IMU assignment does *not* predict recidivism would suggest either (1) that IMU-provoking behavior and the IMU experience are both neutral; or (2) that the behavior predicts recidivism as a main effect, but this effect is neutralized by the IMU experience. Neither of these hypotheses is supported.
3. We found, with qualifications, that IMU assignment predicts *higher* recidivism. We may conclude that IMU confinement does not appear to *help* control recidivism, which advances knowledge beyond its present null state. But we do not know whether the predictive effect is due to the IMU experience or to some psychological process that leads prison staff to see the offender as threatening and which, after release, leads to further criminal aggression.

Despite difficulties of interpretation, our findings make an important contribution, indeed the first contribution of systematic research, to assessing the effects on recidivism of our nation's experiment with supermax confinement. Furthermore, our unanticipated finding of an interaction between mental illness and the predictive effect of IMU assignment, suggests that assignment to IMU does not uniformly respond to a character trait that predisposes prisoners to future crime. Perhaps, in the case of prisoners with mental illness, it simply indicates that they are unfit for the rigors of prison existence. This

possibility leads to the question: are prison staff mistaken about the dangerousness of the mentally ill people they assign to IMU, or is their dangerousness a function of being in prison? Either way, we may call into question the legitimacy of current procedures, and recognize the need for further study as more than academic.

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