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# Psychiatric Deinstitutionalization and Prison Population Growth: A Critical Literature Review and Its Implications

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**Abstract**

A substantial amount of research has been devoted to explaining the reasons behind the unprecedented explosion of U.S. prison populations. While the majority of prior studies related imprisonment to four factors—specifically crimes, changes in the labor markets, politics, and demographic changes—other relevant factors have not received as much attention. In the historical context of decreases in mental hospital populations resulting from psychiatric deinstitutionalization, imprisonment rates have skyrocketed nationwide since the late 1970s. This inverse relationship between both trends has called for prior research that empirically examines the impact of mental hospitalization on imprisonment, especially through the criminalization of mental illness. However, empirical findings are equivocal in general at the aggregate level. This article conducts a comprehensive and critical literature review, discusses the important conceptual and methodological limitations of the existing literature, and finally provides guidance for future research.

**Keywords**

jail/prison, mental hospital, psychiatric deinstitutionalization, trans-institutionalization, social control

## Introduction

Over the past three decades, there has been a large and growing amount of scholarly attention devoted toward explaining the reasons behind the unprecedented growth of

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U.S. prison populations.[1] There are many potential sources of the growth, and corresponding explanations were used to understand it, such as crimes, demographic changes (age and race distributions), changes in the labor market and economic conditions (Rusche & Kirchheimer, 1939/2003), politics (Foucault, 1977/1995; Garland, 2001; Tonry, 2006), collective consciousness (Durkheim, 1984), culture (Garland, 1990), and psychiatric deinstitutionalization (Scull, 1984). While the majority of prior empirical studies related imprisonment to the first four factors, other relevant factors have not received much of the attention (Pfaff, 2008).

There has been scholarly attention given to whether and/or how much psychiatric deinstitutionalization contributes to the explosive increase of U.S. imprisonment. Given that relatively little aggregate-level empirical research is available and its findings are inconsistent, there is a continuing need for more research using a wide range of research designs. This article conducts a comprehensive and critical review of the historical and empirical literature and provides guidance for future research. Specifically, this article is composed of three sections. First, it discusses historical and theoretical foundations for understanding the deinstitutionalization–imprisonment relationship. Second, it provides a literature review of prior empirical studies and delineates what we know (and don't know) about the relationship under consideration. Third, it identifies key conceptual and methodological limitations in the existing literature and offers research implications for more accurate and stable findings.

## Historical and Theoretical Foundations

### *Historical Perspectives on Confinement: Origin and Evolution*

Several theorists have established historical and theoretical frameworks for understanding the history of prisons and asylums in the United States (Grob, 1973, 1983, 1991, 1994; Rothman, 1971, 2002; Scull, 1977, 1984). With shifts in the specific social, political, and intellectual contexts of which it was part, confinement emerged and evolved to meet the demands of society. During a time of growth and instability during the Jacksonian Era (approximately 1820-1840), custodial institutions (prisons, asylums, and almshouses) emerged and grew together as part of a response to the social problems (crime, insanity, and poverty) brought by industrialization and urbanization (Grob, 1973, 1994; Rothman, 1971; Scull, 1977, 1984). As social geographic mobility became intensive and general, Americans worried about the erosion of local norms and cohesion, which was based on strong kinship and mutual discipline among families and neighbors. There was also the unprecedented distance and distrust between social classes. The institutional solution played an important role in restoring social norms and cohesion by casting out marginalized groups and confirming the goodness of the mainstream society. In addition, greater sensitivity to physical pain under the influence of Enlightenment facilitated the shift from corporal punishment and toward the use of incarceration as a primary punishment.

Although they share the same origin, the subsequent use of prisons and asylums has remarkably differed over time in the United States. In the Progressive Era (approximately 1890s-1920s), insane asylums expanded more rapidly and substantially than

prisons and reformatories (Sutton, 1991). The number of asylum inmates had surged dramatically from about 40,000 in 1880 to more than 263,000 in 1923. This explosive growth of asylum populations was attributable to a shifting of patients between different types of social-control institutions, especially from almshouses to asylums (Grob, 1983; Sutton, 1991). As almshouses declined, substantial numbers of the elderly poor, who had previously been taken care of in almshouses, became trans-institutionalized in asylums. Asylum populations continued to increase fairly and reached its peak in the 1940s. This trend leveled off and remained steady until the 1950s despite small fluctuations. On the other hand, incarceration rates were very low relative to mental hospital rates and remained fairly steady in the late 19th century and until the 1960s (Sutton, 1991).

As the public image of mental hospitals had deteriorated gradually in the early 20th century, mental hospitals were regarded as an inappropriate setting to cope with the problems of mental illness and the mentally ill (Harcourt, 2011). Asylum populations began falling dramatically in the 1960s and 1970s as a result of deinstitutionalization and other mental health policies (more stringent civil commitment criteria and community-based treatment programs). In the historical context of low mental hospital populations, there was a skyrocketing surge in prison populations in the late 1970s and throughout the next three decades. These trend reversals in both populations have stimulated considerable public debate and scholarly attention on the trans-institutionalization of patients from mental hospitals to jails and prisons.

## *Theoretical Perspectives on Confinement and Toward the Deinstitutionalization of Psychiatric Patients*

There are two theoretical perspectives on confinement (Grob, 1983; Ignatieff, 1981): traditional (or liberal) and revisionist. First, traditional scholars portrayed confinement as a humane advance from cruel punishments of the body (e.g., Deutsch, 1946; Grob, 1966). As a philanthropic reform, confinement is seen to provide the care and treatment for deviant and mentally ill groups. Second, revisionist scholars characterized confinement as being inherently repressive (e.g., Foucault, 1965/1988, 1977/1995; Ignatieff, 1981, 1978/1989; Rothman, 1971; Scull, 1977, 1984). Confinement is viewed as an instrument of social control over unproductive persons who manifest disruptive behavior.

Despite differences in underlying assumption, a common feature of the two accounts is that institutional responses failed to fulfill their goals but for different reasons. Traditionalists believe that confinement could be more therapeutic with sufficient resources; thus, the failure of reforms is seen as temporary. Several scholars demonstrated the benefits inherent in institutional solutions to crime and mental illness. For example, using some historical evidence at Worcester State Hospital in Massachusetts, 1830 to 1920, Grob (1966) found that therapeutic staff with "kind, humane, and optimistic" attitudes could raise the chance for the recovery of patients significantly up to 82% to 91% of admitted patients (p. xiii). According to Rothman (2002), the failures of progressive reforms in prisons and asylums do not lie in the

concept of institutionalization or in the absence of rehabilitation but in the pragmatic drawbacks such as understaffing, inadequate facilities, poor implementation of programs, and custody-oriented administration.

According to revisionists, the failure of confinement is viewed as an inevitable consequence of institutional solutions. Madness and crime are not just a pathological phenomenon that can be addressed by applying medical knowledge and treatment. Instead, they are socially constructed categorizations that define marginalized groups (criminals, lunatics, the poor, and uncontrolled immigrants) as "abnormal," thereby affirming the "normalness" of the mainstream society (Foucault, 1965/1988). During the periods of social instability and unrest brought by industrial revolution and urbanization, prisons and asylums were created to control marginalized groups, and thus institutional confinement was repressive and abusive toward them.

Both perspectives on psychiatric deinstitutionalization have different attitudes. While having more optimistic attitudes toward mental illness, traditionalists believe that people with mental disorders could be to some extent cured in mental hospitals with caring therapists and ample resources (Grob, 1966). Thus, they may be suspicious of deinstitutionalization and instead favorable to institutional care in mental hospitals. In contrast, revisionists would cast doubts on the effectiveness of mental hospitals because mentally ill patients were often subject to neglect, abuse, or exploitation by staff (Foucault, 1965/1988; Scull, 1977, 1984). Their mental health problems were also easily aggravated due to inhuman conditions inside asylums. Thus, they are more favorable toward the deinstitutionalization of patients. In the following section, this article discusses causes of deinstitutionalization and its social consequences, especially focusing on the criminalization of mental illness.

## *Deinstitutionalization: Social Causes and Consequences*

During the post–World War II (WWII) period, U.S. mental health care underwent a major shift away from institutional care and toward non-institutional care. Psychiatric deinstitutionalization refers to a fact, a process, and a philosophy of shifting mental health care for the mentally ill to community-based outpatient facilities, thereby reducing the population of state mental hospitals (Bachrach, 1989; Goldman, Adams, & Taube, 1983). There are major contributing factors to the deinstitutionalization of the mentally ill (Harcourt, 2011): increasing public awareness of the abuses and inhumane conditions endemic to mental hospitals, development of psychiatric medicines, changes in social attitudes toward mental illness, and federal funding and cost-shifting incentives.

First, many mental hospitals were subject to criticism by WWII conscientious objectors and other intellectual groups for being a dumping ground without providing appropriate treatment (Grob & Goldman, 2006). As the abuses of patients were brought to light and their rights to treatment were reexamined under the civil rights movement, many states tightened the involuntary civil commitment criteria (Brooks, 2007).

Second, chlorpromazine or a similar antipsychotic medication was first developed in 1950 and became widely available by the mid-1950s (Torrey, 1997). Based on a review of published cases, Gronfein (1985b) concluded that psychotropic drugs are effective in treating psychological symptoms (depression, hallucinations, and anxiety

disorders), producing socially desirable and acceptable behaviors, and even controlling homicidal and suicidal behavior.

Third, advances in psychiatric medication and knowledge about mental illness created societal perceptions that mental disorders are curable and the majority of the mentally ill can be effectively treated in community-based environments (Gronfein, 1985b). Unless posing a clear and significant threat to themselves or others, persons with a mental illness were not institutionalized in a mental hospital.

Fourth, based on the principle that mental illness can be treated in the least-restrictive environment with the help of drug therapies, the Community Mental Health Act of 1963 (CMHA) was enacted to provide federal funding to states for the establishment of community mental health centers. In addition, the mentally ill in the community, who usually live without family support and are often homeless, became eligible for various federal benefits such as Supplemental Security Income (SSI), Medicaid, Medicare, food stamps, and other benefits (Torrey, 1997). To take advantage of these financial incentives, state governments shifted patients out of mental hospitals and into community-based outpatient facilities. Thus, the cost of care for the mentally ill was shifted to the federal government from states in financial crises.

There has been a controversy over the relative importance of each of the contributors. Many scholars argued that federal financial incentives and fiscal crises of the states are the primary reasons for adoption of deinstitutionalization (Aviram, Syme, & Cohen, 1976; Brown, 1985; Grob, 1991; Gronfein, 1985a, 1985b; Lerman, 1982; Scull, 1984; Segal & Aviram, 1978; Torrey, 1997, 1988). Humanitarian accounts of deinstitutionalization and the introduction of medication are secondary and considered as ideological and scientific camouflage for the fiscally motivated aspect of deinstitutionalization (Scull, 1984). Using interstate data, Gronfein (1985b) empirically assessed the timing of deinstitutionalization associated with the introduction of psychotropic drugs and demonstrated that the introduction of drugs did not initiate deinstitutionalization and instead just facilitated the deinstitutionalization process in the 1960s. Federal financial incentives played a more significant role in initiating deinstitutionalization than other contributors.

The deinstitutionalization policy has led to the closing or downsizing of many state mental hospitals and corresponding increases in the number of mentally ill persons for outpatient services (Grob, 1994; Harcourt, 2011). However, community mental health centers, which were not adequately funded by the states, failed to provide follow-up care for the mentally ill. Due to a lack of personal and community resources, they were at risk of being homeless, being poor, or being a victim of or involved in crime and finally ended up being trans-institutionalized in different institutions such as nursing homes, board-and-care homes, jails, and prisons. This study focuses on trans-institutionalization of patients from mental hospitals to jails and prisons.

## Empirical Findings of Deinstitutionalization and Imprisonment

The focus of the current literature review is on macro studies of social control that used collectives (cities, states, and countries) as the units of analysis and examined

how imprisonment rates are influenced by deinstitutionalization and changes in mental health policies at the aggregate level.[2] To examine trans-institutionalization between mental hospitals and prisons, researchers used two types of research strategies: social indicators and survey research. The majority of prior research assessed the impact of deinstitutionalization on prison populations using aggregate-level social indicators. Three types of research design were used in social indicators research: cross-sectional, time-series, and pooled time-series (panel; see Table 1). First, prior studies using cross-sectional data generated inconsistent findings (for supportive evidence, see Biles & Mulligan, 1973; Grabosky, 1980; Penrose, 1939; for non-supportive evidence, see Grabosky, 1980; Liska, Markowitz, Whaley, & Bellair, 1999). For example, in a study of 18 European countries, Penrose (1939) concluded that there is an inverse relationship between imprisonment and mental hospitalization rates. Penrose found that the extent of crime in a country was negatively related to the number of mental health patients. Mental disorders are assumed to be "predisposing causes of crime." In addition, Penrose noted that as relative terms, criminality and mentality are socially constructed to distinguish between the socially desirable and undesirable. The development of both custodial systems relies not only on the standards of social undesirability and normality but also on the financial resources. The inverse relationship reflects differences between the countries in the relative use of mental hospitals or prisons as an alternative way of segregating the socially undesirable. Later, Biles and Mulligan (1973) supported Penrose's trade-offs (zero sum) relationship using a sample of six states of Australia. Both findings were found based on the bivariate correlation analysis. In contrast, using multivariate analyses, several studies found no support for the trade-off relationship (Grabosky, 1980; Liska et al., 1999). For example, Liska et al. (1999) estimated the impact of mental health capacity on jail admission rates using a sample of 100 U.S. cities for 1978, 1983, and 1988. Hospital capacity did not exert a statistically significant effect on jail admissions for any year.

Second, time-series studies produced weak evidence of trans-institutionalization (for supportive evidence, see Palermo, Gumz, & Liska, 1992; for non-supportive evidence, see Grabosky, 1980; Inverarity & Grattet, 1989). Drawing on aggregate national data from 1926 to 1987, Palermo et al. (1992) found a significant and negative (bivariate) correlation between mental hospital and jail populations. However, multivariate studies reported that there is no evidence of trade-offs. Grabosky (1980) built two separate regression models of imprisonment rates using either U.S. national time-series (1930-1970) or cross-state (1970) data. The impact of psychiatric hospitalization rates is non-significant and positive, and thus both custodial systems are "essentially independent" (p. 63). While assessing the impact of unemployment on various social-control policies using U.S. time-series data from 1948 to 1985, Inverarity and Grattet (1989) examined the extent to which trade-off relationships exist among social-control policies (mental institutionalization, military enlistments, and welfare rolls). Of particular interest is no evidence of trade-offs between mental hospitals and prison admission rates was found.

Third, relative to the number of cross-sectional and time-series studies, very few studies used pooled time-series or panel data. For example, using U.S. state-level data

**Table 1.** Summary of Findings of Social Indicators Research on Deinstitutionalization and Imprisonment Using Aggregate-Level Data.

| Study | Data (unit; period; obs.) | Research design | Independent variable | Dependent variable | Statistical analysis | Control variable | Findings: Sig.; (+/−) |
|---|---|---|---|---|---|---|---|
| Prison studies | | | | | | | |
| Penrose (1939) | European nations; 1934; 14 | CS | HI | PI | BC | No | NA; (−) |
| Biles and Mulligan (1973) | Australia states; 1968; 6 | CS | HC | PI | BC | No | Sig.; (−) |
| Grabosky (1980) | U.S. states; 1967; 50 | CS | HI | PI | BC | No | Sig.; (−) |
| | U.S. states; 1970; 50 | CS | HI | PI | BC | No | Non-sig.; (−) |
| | U.S. states; 1973; 50 | CS | HI | PI | BC | No | Non-sig.; (+) |
| | U.S. states; 1970; 50 | CS | HI | PI | MR | No | Non-sig.; (−) |
| | United States; 1930-1970; 41 | TS | HI | PI | BC | No | Sig.; (+) |
| | United States; 1930-1970; 41 | TS | HI | PI | MR | Yes | Non-sig.; (+) |
| Inverarity and Grattet (1989) | United States; 1948-1985; 37 | TS | HA | PA | MR | Yes | Non-sig.; (+) |
| Palermo, Gumz, and Liska (1992) | United States; 1931-1985; 41 | TS | HP | PP | BC | No | Sig.; (−) |
| | discontinuous years | TS | HP | PAP | BC | No | Sig.; (−) |
| Liska, Markowitz, Whaley, and Bellair (1999) | U.S. cities; 1978, 1983, and 1988; 100 | CS | HC | JA | MR | Yes | Non-sig.; (+/−) |
| Raphael (2000) | U.S. states; 1971-1996; 1,326 | PD | HI | PI | MR | Yes | Sig.; (−) |
| Raphael and Stoll (2013) | United States; 1950, 1960, 1970, and 1980; n/a | PD | HI | PI | MR | Yes | Non-sig.; (+/−) |
| | United States; 1980 and 2000; n/a | PD | HI | PI | MR | Yes | Sig.; (−) |
| Crime studies | | | | | | | |
| Penrose (1939) | European nations; 1934; 14 | CS | HI | CR | BC | No | NA; (−) |
| Biles and Mulligan (1973) | Australia states; 1968; 6 | CS | HC | CR | BC | No | Non-sig.; (+) |
| Markowitz (2006) | U.S. cities; 1990; 81 | CS | HC | HL; CR; AR | MR | Yes | Sig.; (−) |

*Note.* Obs. = observations; Sig. = significant; CS = cross-sectional analysis; HI = mental hospital institutionalization rate; PI = prison imprisonment rate; BC = bivariate correlation; NA = not available/no answer; HC = mental hospital capacity; non-sig. = non-significant; MR = multivariate regression; TS = time-series analysis; HA = mental hospital admission rate; PA = prison admission rate; HP = mental hospital population; PP = prison population; PAP = prison admission population; JA = jail admission rate; PD = panel data analysis; CR = crime rate; HL = homeless rate; AR = arrest rate; n/a = not available.

covering the period from 1971 to 1996, Raphael (2000) found that hospitalization rates have strong negative effects on imprisonment rates. Specifically, 4.5% to 14% of the total state prison population in 1996 was attributable to deinstitutionalization from 1971 to 1996. Using U.S. census data from 1950 to 2000, Raphael and Stoll (2013) also examined the contribution of deinstitutionalization to U.S. prison growth while controlling for a variety of state, gender, age, and race fixed effects. From 1950 to 1980, there was no evidence of trans-institutionalization for all the demographic groups. However, for the period between 1980 and 2000, they found significant evidence of trans-institutionalization for both males and females. Deinstitutionalization is responsible for a relatively small (about 4% to 7%) percentage of prison growth between 1980 and 2000. According to the contemporary research standard, both research used the most rigorous research designs.

It is important to discuss in what mechanism does deinstitutionalization contribute to the growth in prison populations. As discussed above, Penrose (1939) found that the provision of psychiatric services in mental hospitals decreases the frequency of crimes and accordingly leads to a decline in prison populations. However, Biles and Mulligan (1973) failed to confirm Penrose's inverse relationship between crime and mental hospitalization. Both studies used bivariate correlation analyses for their findings. Most importantly, using a sample of 81 U.S. cities and multivariate analyses, Markowitz (2006) found that cities with greater hospital capacity have lower rates of crime and arrest, and the relationship is substantially mediated by homeless rates. In sum, as a result of deinstitutionalization, the mentally ill who would have been previously institutionalized in mental hospitals are at risk of being homeless, involved in crime, subject to arrest, and finally held up in jails and prisons due to a lack of personal and community resources.

Relative to the amount of social indicators research, few survey studies were conducted to examine the trans-institutionalization mechanisms through which the mentally ill move from mental hospitals to jails/prisons or vice versa. In a study of six states (New York, California, Arizona, Texas, Iowa, and Massachusetts), Steadman, Monahan, Duffee, Hartstone, and Robbins (1984) found overall increases in the number and percentage of prisoners with a history of mental hospitalization, especially in three states (California, Iowa, and Texas), between 1968 and 1978 as a result of deinstitutionalization. During the same time period, there were also increases in the number and percentage of admitted patients with prior arrests, especially in four of the six states (Arizona, California, New York, and Texas), despite declines in the overall number of mental hospital admissions. Modlin (1979) also found that there was a 300% increase in the Santa Clara County Jail population after the closing of one California state hospital. In addition, using two 1968 and 1978 samples of defendants from three states (California, Massachusetts, and New York), Arvanites (1988) concluded that as a result of stricter restrictions on civil commitment to a mental hospital and deinstitutionalization, there were increases in "incompetent to stand trial" (IST) commitments to mental hospitals, especially for those arrested for violent crimes. Thus, the percentage of IST defendants with mental health histories increased significantly in each state. Finally, there was a 227.6% increase from 1975 to 1979 in the number of

incidents involving a mentally ill individual coming to police attention (Bonovitz & Bonovitz, 1981).

In sum, there have been inconsistencies in the relationship between the structure and functioning of mental health and criminal justice systems. Specifically, historical and survey studies reported evidence of trans-institutionalization between mental hospitals and jails/prisons. However, empirical findings using social indicators data are still equivocal, and it is uncertain whether and how much an effect deinstitutionalization had on the U.S. prison growth. The estimated coefficients differ highly in both magnitude and direction, both within and across studies. Such instability may result from complicated and dynamic underlying relationships and/or shortcomings in model design. The inconsistency and uncertainty of prior findings call for more future research using a more accurate design. This article discusses key conceptual and methodological limitations in the existing literature and provides corresponding implications for future research.

## Implications for Future Research: Limitations and Suggestions

### *Conceptualization and Measurement*

*Defining social-control activities of mental health and criminal justice systems.* When estimating the cross-system effects of the mental health and jail/prison systems on each other, it is important to discuss how to define and measure their social-control activities. Inappropriate conceptualizations and measurements render estimated coefficients misleading in both direction and magnitude, which weakens confidence as to the empirical outcomes. Prior research examined the relationship of interest with various measures being used such as capacity, institutionalization rates, admission rates, and actual levels of populations (see Table 1). Although these measurements reflect dimension of both custodial activities and are correlated with one another, it is still important to conceptually and methodically distinguish them. Different outcomes might turn out according to the definition and measurement of control activities.

As an independent variable, deinstitutionalization and changes in mental health policies have been operationalized by the degree of mental hospitalization. Mental hospitalization rates (i.e., the number of patients per capita) were predominantly used as a way to measure control activities of the mental health systems. In addition, inpatient mental capacity, admission rates, and actual levels of mental health populations were employed in the prior literature.

As a dependent variable, imprisonment rates are frequently used in prior research, which is defined as the number of sentenced prisoners per capita. However, this stock measure overlooks several distinct processes operating at different points in the incarceration process as it captures all the possibilities of incarceration, such as new admissions, conditional/unconditional early releases, and returns for parole violations. It confounds the use of sentences to confinement with sentence length, release practices, and parole revocation practices. Instead, admission rates as a flow measure,

the number of yearly admissions per capita, may provide a more simple, direct, and sensitive measure of social-control practices through confinement (see Berk, Messinger, Rauma, & Berecochea, 1983; Galster & Scaturo, 1985; Lynch, 1988; McCarthy, 1990; Rauma, 1981). The flow measure is preferable than the stock measure to conceptualize and operationalize confinement patterns in response to changes in mental health policies.

According to Liska et al. (1999), it is more appropriate to model the cross-system relationships between mental hospitals and prisons as the effect of capacity rates (the number of beds, cells, or personnel per capita), or alternatively, admission rates, of one system on admission rates of the other. For example, to the extent that the capacity of mental hospitals is decreasing, it decreases the admission rates of its own system but increases the admission rates of jails and prisons. In contrast, while the admission rate of mental hospitals may affect their own future capacity rate, it is unlikely to directly affect the capacity rate of jails and prisons. In addition, future researchers may consider employing discharge rates as a more direct proxy for operational deinstitutionalization in estimating its impact on jails and prison admission rates. Discharge rates as a flow measure at the back-end can provide some insight on what percentages of released mentally ill persons are transferred to jails and prisons during a particular period of time.

*Causal link: Differential offending versus differential treatment.* There are two theoretical models to explain the deinstitutionalization–imprisonment relationship: differential offending and differential treatment (see Box & Hale, 1982; Chiricos & DeLone, 1992). The first theoretical linkage is traced to criminal offending. Prisons admissions and populations are assumed to expand as crime is stimulated by deinstitutionalization. It is thus important to examine the extent to which the relationship is mediated by crime. Another key element of theorizing is that deinstitutionalization has a direct effect on prison populations independent of its indirect effect on crime. Specifically, the criminal justice system consists of various agencies (i.e., law enforcement, courts, and corrections) with a series of decision-making authorities. Imprisonment at any given point could be a function of official decisions at different points in the criminal justice process. It is thus postulated that persons with mental illness are more likely than other offenders to be arrested, prosecuted, convicted, and sentenced to prison because criminal justice agencies view them as more dangerous and threatening to social order.

In sum, not controlling for crime confounds the direct and indirect effects of deinstitutionalization. For example, suppose that a regression (with log-transformed variables) reveals a *b* coefficient on deinstitutionalization of negative five, indicating that a 1% decrease in mental hospital population per capita raises prison population by 5% per capita. This result does not tell us where this increase originates. It may result from differential treatment of criminal justice agencies against the mentally ill at various stages, as well as differential offending of the mentally ill, or by a combination of both. Given the complicated dynamics of the deinstitutionalization–imprisonment association, it is essential to carefully conceptualize its causal process and include crime rates in model specification.

*Historical contingency of the relationship.* Most of the existing literature overlooks the importance of socio-historical context in its theoretical and analytical conceptualizations. Historical sociologists criticize the conventional ahistorical approach and instead suggest an "historical time" approach (Griffin, 1992; Hassard, 1990; Isaac, 1997). Time is composed of qualitatively differentiated temporalities that have characteristics of discontinuity, non-linearity, and heterogeneity in form, magnitude, and consequence (Isaac & Griffin, 1989). Social institutions and their relations are produced, maintained, and changed by social factors, and their meaning and consequences are historically contingent and differ across different times.

Based on the historical and theoretical foundations, the nature of the relationship between mental health and prison systems might be conditional on the period of time the data were collected. For example, both systems emerged and grew together during roughly the same time periods as institutional solutions to social problems brought by industrialization and urbanization. Social historians assume a positive relationship in which common social threat, as perceived by the powerful (elites, authorities, or social majorities), influenced the concurrent emergence of both asylums and prisons (Liska et al., 1999). This social threat hypothesis is useful in explaining the emergence of social-control systems during the 19th century. On the other hand, social indicator researchers assume a negative relationship in which an increase in either an asylum and prison population leads to a decrease in the population of the other system due to the lack of financial resources (Liska et al., 1999). This functional-alternative (trade-off or zero sum) hypothesis is useful in explaining the inverse relationship between prison and mental hospital populations during the 20th century.

Finally, there is a recent empirical finding that may offer support for the historical contingency of the deinstitutionalization–imprisonment relationship. As discussed previously, Raphael and Stoll (2013) found no evidence of trans-institutionalization for the period between 1950 and 1980, but there was significant evidence between 1980 and 2000. It is possible that there might be a temporal transition in the relationship of deinstitutionalization with imprisonment during the late 1970s and early 1980s. Specifically, although the deinstitutionalization–imprisonment association is not significant in the early period (1950-1980), a time that lacked punitive penal policies and practices, the relationship in the latter period (1980-2000) becomes significant and negative when "get-tough on crime" policies and laws (e.g., mandatory sentencing, truth in sentencing, three strikes laws, immigration laws, vagrancy and enticement laws, zero tolerance policies, and the war on drugs) were prevalent and the mentally ill were more likely to be subject to those criminal policies and laws. It is beneficial if future researchers attempt to find time-varying casual relationships between mental health and prison populations in various contexts.

## *Omitted Variable Bias and Model Specification*

As imprisonment is a complex social phenomenon, it is important to identify and account for as many relevant explanations as possible beyond the bivariate causal process underlying the deinstitutionalization–imprisonment relationship (Liska et al.,

1999). When relevant variables are left out in model specification, estimated coefficients of the relationship are biased in both the direction and magnitude, and there are also statistical problems such as biased standard errors, low $R^2$ statistic, and inaccurate confidence intervals and hypothesis tests (Studenmund, 2001; Wooldridge, 2006). As mentioned previously, because the findings of the prior studies were largely based on bivariate analyses, any significant or non-significant relationships may be inaccurate. The findings could have resulted from the omitted-variables bias.

There are several solutions to address the omitted variable problem (Spelman, 2000). Most of all, the classical experiment, coupled with random sampling, may reduce the potential problems of left-out variables by ruling out threats to internal validity. However, this true experiment design would be implausible because mental health policies cannot be manipulated and randomly implemented in specific locations by the researcher. Within its particular socio-economic political contexts, deinstitutionalization was occurring in each place at different times and in many different ways.

Alternatively, researchers should include many socio-economic and criminal justice variables that both theory and past research suggest may affect imprisonment rates. It should be noted that the multi-collinearity problem can be a major cause of concern in model specification if many of the relevant control variables are substantially related to one another. Using factor or cluster analysis, researchers can reduce many control variables to a manageable number. This is also helpful in addressing degrees of freedom problems (Spelman, 2000). Finally, researchers can remove the effect of omitted variable bias by controlling the fixed effects of each state (or city and nation) using cross-sectional data, the fixed effects of each time period (year) using time-series data or the fixed effects of both variations using panel data. One way to do this is to include dummy variables for all but one of the states or the years and then build fixed effects regression models. These state and time dummy variables can account to some extent for the effects of unobserved variables that affect imprisonment rates across places and time (Spelman, 2000; Wooldridge, 2006).

## *Endogeneity/Simultaneity Bias: Using Instrumental Variables Approach*

Another concern with the existing literature is the failure to account for an endogenous relationship between mental health and criminal justice systems. Endogeneity bias generates a bias in the ordinary least square (OLS) estimates, thereby leading to biased and inconsistent coefficients (Wooldridge, 2006). Very few prior studies addressed this issue in the criminological literature (e.g., Angrist, 2006; Levitt, 1996; Listokin, 2003; Raphael & Winter-Ebmer, 2001).

The one, most important, way to solve the endogeneity problem is to use an instrumental variables approach, which is also effective in addressing the problems of omitted variable bias and measurement error. Using annual, state-level panel data from 1971 to 1993, Listokin (2003) examined the relationship between crime and prison admissions rates. When crime is instrumented by abortion, the coefficients of prison admissions with respect to crime are nearly two times greater than the OLS coefficients. Using prison-overcrowding litigation as an instrument, Levitt (1996) assessed

the effect of prison population on crime. The coefficient estimates are two to three times greater than those of prior studies. The data set used in this study was a panel of annual, state-level data from 1985 to 1997. Finally, Raphael and Winter-Ebmer (2001) estimated the effect of unemployment on crime using a panel of annual, state-level data from 1971 to 1997. When state military contracts and a measure of state exposure to oil shocks were used as instruments, the estimates exceeded the OLS estimates and were more stable across model specifications. Unemployment exerts a significantly positive effect on property crime rates while the evidence for violent crime rates is considerably weaker.

As the deinstitutionalization–imprisonment relationship is endogenous, it is important to identify any instrumental variables. For example, consider the following two-stage least squares estimates (2SLS) regressions:

$$X_i = \pi_0 + \pi_1 Z_{1i} + \pi_2 W_{1i} + \ldots + \pi_{1+r} W_{ri} + \nu_i, \quad (1)$$

$$Y_i = \beta_0 + \beta_1 \widehat{X}_i + \beta_2 W_{1i} + \ldots + \beta_{1+r} W_{ri} + u_i, \quad (2)$$

where $X_i$ is the $i$th observation of the endogenous deinstitutionalization variable, $Z_{1i}$ is the $i$th observation of the instrumental variable, $Y_i$ is the $i$th observation of the imprisonment variable, and $\widehat{X}_i$ is the $i$th predicted value of $X_i$. In the first-stage equation, the instrument ($Z_i$) is an exogenous determinant of the independent variable ($X_i$). The instrument is correlated with changes in the deinstitutionalization variable ($X_i$), but it should be uncorrelated with any omitted variables contained in the residual ($\nu_i$) of the first-stage equation. In other words, the instrument variable should not be associated directly with changes in the imprisonment variable. Instead, it affects the imprisonment variable only through its impact on the deinstitutionalization variable. This instrument variables approach can produce more consistent estimates than the OLS estimates when the deinstitutionalization and imprisonment variables are endogenous.

However, very few prior studies addressed the simultaneity bias for the deinstitutionalization–imprisonment relationship. For example, Raphael and Stoll (2013) attempted to employ state involuntary commitment laws as an instrument for changes in imprisonment rates but failed to find a strong effect of the statutory variation on hospitalization rates at the first-stage regression. The challenge is to find a good instrument variable that is associated with the deinstitutionalization variable but is not related to the imprisonment variable (e.g., suicide rates).

A second strategy, which is more an ad hoc solution especially in longitudinal or time-series analyses, is to exclude a contemporaneous effect of the deinstitutionalization variable on the imprisonment variable and instead include its lagged effects. Lagged coefficients can statistically address the simultaneity problem between the two endogenous variables because mental health rates in the prior year(s) can influence prison population rates in the current year, but not vice versa. Lagged effects also theoretically account for the temporal process in which mentally ill persons are

deinstitutionalized, become homeless, are involved in deviant behaviors, and are subject to arrest and incarceration. It is imperative to allow for the time needed to incarcerate offenders after their release from the mental hospital in model specification.

## Data Availability

While the majority of prior research was based on U.S. data at the state or national level, relatively few studies employed local U.S. data, non-U.S. data, or cross-national data. A concern with the literature is that the data were often taken from the same sources at the state or national level, and thus researchers have looked for outcomes in the same place. However, the degree to which deinstitutionalization affects prison populations varies across cities/counties, states, and even countries. As each society has a unique pattern of social-control contextualized within its specific contexts, mental health and penal policies are inherently local in character. To compare any regional differences, it is essential to consider two alternative sources of data: local-level data and cross-national data. More geographically disaggregated data and cross-national data will reveal whether there is any local or cross-national variation in the relationships of the two systems.

## Research Design

Types of analysis are an important determinant of study outcomes. Most of the prior studies used either time-series or cross-sectional data. Time-series analyses can be used to examine complex relationships among the variables under investigation (e.g., temporal ordering, lagged effects, historical contingency of causality, non-linear causality) and forecast future values of a time series (Ostrom, 1990). However, in the time-series research design, findings are often inflated about the degree of relationships between the variables due to the failure of adequately controlling for an intra-series trend and/or any other relevant variables. On the other hand, cross-sectional analyses are useful when there is greater variance among cross sections of geographic locations than variation among different time periods. Although being useful to compare regional differences, cross-sectional analyses tend to overlook the importance of time and time-varying relationships of interest.

For future research, researchers may consider using long-term panel or pooled time-series analyses at the regional or state level. They can account for both temporal and spatial variation in the relationships under investigation. Although the collection and analysis of panel or pooled time-series data are complicated and costly, both analyses have a greater capacity to model the dynamic relationship between mental health and prison systems than either cross-sectional or time-series data analysis alone (Hsiao, 2007). They also increase the sample size by pooling data from a variety of locations over many years. Sensitivity to both time and place helps to explore the varying impact of deinstitutionalization on prison populations over time and across spatial locations.

## Conclusion

To reiterate, there are conceptual and methodological limitations that are worthy of attention in the prior literature: conceptual and measurement problems, model specification (omitted variable problem), endogeneity bias, data availability (lack of data from different sources), and research design. To develop more accurate estimates on the deinstitutionalization–imprisonment relationship, five recommendations were suggested as follows:

1. Exploring complicated underlying relationships between mental health and prison systems, such as conceptualizing and measuring social-control activities of both systems, lagging processes affecting imprisonment, and historical contingency.
2. Including a wide range of control variables to avoid omitted variable bias.
3. Adopting instrumental variable approaches to address the potential for endogeneity bias as well as omitted variable bias.
4. Drawing on alternative sources of data such as more geographically disaggregated U.S. data and/or cross-national data to compare regional differences in the relationship of interest.
5. Using long-term panel or pooled time-series data analyses to account for both cross-sectional and temporal variation in the relationship under investigation.

Although these suggestions may not address all the conceptual and methodological problems, it is hopeful that this article will take a small, progressive step toward filling theoretical and empirical gaps in the existing literature and provide researchers enough momentum for stimulating additional research on social control. Using a wide range of more advanced designs, multiple evaluations will lead to reaching a robust consensus on the nature of the deinstitutionalization–imprisonment relationship. It is essential to take an interdisciplinary approach to the studies of mental health and prison systems. As there are scholars who study comparable problems as their primary focus in both mental health and criminal justice fields, they should build on each other to explore the nature of trans-institutionalization between both custodial institutions. Finally, the deinstitutionalization–imprisonment association is not just a theoretical issue, but it has significant implications for public health and safety policy on whether society treats mentally ill persons in the mental health systems or in the criminal justice systems. This article stimulates and informs public policy decision making that are of vital importance to the public health and safety of citizens.

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## Notes

1. According to Carson and Golinelli (2013), after reaching the highest peak of 1,616,487 in 2009, the overall prison population has decreased to an estimated 1,571,013 state and federal prisoners in 2012 during the recent 3 years.
2. To retrieve an initial set of relevant studies, this article began by conducting a computerized keyword search of online databases. The key words used were criminal justice systems, incarceration/imprisonment, mental health systems, and mental hospitalization, and/or psychiatric deinstitutionalization. The databases searched were Social Sciences Citation Index, EBSCO, Sociology: A Sage Full-Text Collection, and Google scholar. In addition, the bibliographies of relevant studies were used to locate additional studies that may have been missed in the keyword searching. Although the current search methods are exhaustive, only eight eligible prison studies (with three crime studies) were found, which empirically examined the deinstitutionalization–imprisonment relationship using aggregate-level data (see Table 1). The lack of research and its inconsistent findings have called for the present study that stimulates additional research by providing guidance for future research.

## References

Angrist, J. D. (2006). Instrumental variables methods in experimental criminological research: What, why, and how. *Journal of Experimental Criminology*, *2*, 23-44.

Arvanites, T. M. (1988). The impact of state mental hospital deinstitutionalization on commitments for incompetency to stand trial. *Criminology*, *26*, 307-320.

Aviram, U., Syme, S. L., & Cohen, J. B. (1976). The effects of policies and programs on reductions of mental hospitalization. *Social Science & Medicine*, *10*, 571-577.

Bachrach, L. L. (1989). Deinstitutionalization: A semantic analysis. *Journal of Social Issues*, *45*, 161-171.

Berk, R. A., Messinger, S. L., Rauma, D., & Berecochea, J. E. (1983). Prisons as self-regulating systems: A comparison of historical patterns in California for male and female offenders. *Law & Society Review*, *17*, 547-586.

Biles, D., & Mulligan, G. (1973). Mad or bad? The enduring dilemma. *British Journal of Criminology*, *13*, 275-279.

Bonovitz, J. C., & Bonovitz, J. S. (1981). Diversion of the mentally ill into the criminal justice system: The police intervention perspective. *American Journal of Psychiatry*, *138*, 973-976.

Box, S., & Hale, C. (1982). Economic crisis and the rising prison population in England and Wales. *Crime and Social Justice*, *17*, 20-35.

Brooks, R. A. (2007). Psychiatrists's opinions about involuntary civil commitment: Results of a national survey. *Journal of the American Academy of Psychiatry and the Law*, *35*, 219-228.

Brown, P. (1985). *The transfer of care: Psychiatric deinstitutionalization and its aftermath*. Boston, MA: Routledge.

Carson, E. A., & Golinelli, D. (2013). *Prisoners in 2012—Advance counts*. Retrieved from www.bjs.gov/content/pub/pdf/p12ac.pdf

Chiricos, T. G., & DeLone, M. A. (1992). Labor surplus and punishment: A review and assessment of theory and evidence. *Social Problems*, *39*, 421-446.

Deutsch, A. (1946). *The mentally ill in America: A history of their care and treatment from colonial times*. New York, NY: Columbia University Press.

Durkheim, E. (1984). *The division of labour in society* (L. A. Coser, Trans.). New York, NY: Free Press.

Foucault, M. (1988). *Madness and civilization: A history of insanity in the age of reason* (R. Howard, Trans.). New York, NY: Vintage Books. (Original work published 1965)
Foucault, M. (1995). *Discipline and punish: The birth of the prison* (A. Sheridan, Trans.). New York, NY: Vintage Books. (Original work published 1977)
Galster, G. C., & Scaturo, L. A. (1985). The U.S. criminal justice system: Unemployment and the severity of punishment. *Journal of Research in Crime & Delinquency*, *22*, 163-189.
Garland, D. (1990). *Punishment and modern society: A study in social theory*. Chicago, IL: University of Chicago Press.
Garland, D. (2001). *The culture of control: Crime and social order in contemporary society*. Chicago, IL: University of Chicago Press.
Goldman, H. H., Adams, N. H., & Taube, C. A. (1983). Deinstitutionalization: The data demythologized. *Hospital & Community Psychiatry*, *34*, 129-134.
Grabosky, P. N. (1980). Rates of imprisonment and psychiatric hospitalization in the United States. *Social Indicators Research*, *7*, 63-70.
Griffin, L. J. (1992). Temporality, events, and explanation in historical sociology: An introduction. *Sociological Methods & Research*, *20*, 403-427.
Grob, G. N. (1966). *The state and the mentally ill: A history of Worcester state hospital in Massachusetts, 1830-1920*. Chapel Hill: University of North Carolina.
Grob, G. N. (1973). *Mental institutions in America: Social policy to 1875*. New York, NY: Free Press.
Grob, G. N. (1983). *Mental illness and American society, 1875-1940*. Princeton, NJ: Princeton University Press.
Grob, G. N. (1991). *From asylum to community: Mental health policy in modern America*. Princeton, NJ: Princeton University Press.
Grob, G. N. (1994). *The mad among us: A history of the care of America's mentally ill*. New York, NY: Free Press.
Grob, G. N., & Goldman, H. H. (2006). *The dilemma of federal mental health policy: Radical reform or incremental change?* New Brunswick, NJ: Rutgers University Press.
Gronfein, W. (1985a). Incentives and intentions in mental health policy: A comparison of the Medicaid and community mental health programs. *Journal of Health and Social Behavior*, *26*, 192-206.
Gronfein, W. (1985b). Psychotropic drugs and the origins of deinstitutionalization. *Social Problems*, *32*, 437-454.
Harcourt, B. E. (2011). Reducing mass incarceration: Lessons from the deinstitutionalization of mental hospitals in the 1960s. *Ohio State Journal of Criminal Law*, *9*, 53-88.
Hassard, J. (1990). *The sociology of time*. New York, NY: St. Martin's Press.
Hsiao, C. (2007). Panel data analysis—Advantages and challenges. *Test*, *16*, 1-22.
Ignatieff, M. (1981). State, civil society, and total institutions: A critique of recent social histories of punishment. *Crime and Justice*, *3*, 153-192.
Ignatieff, M. (1989). *A just measure of pain: The penitentiary in the industrial revolution 1750-1850*. London, England: Penguin Books. (Original work published 1978)
Inverarity, J., & Grattet, R. (1989). Institutional responses to unemployment. *Contemporary Crises*, *13*, 351-370.
Isaac, L. W. (1997). Transforming localities: Reflections on time, causality, and narrative in contemporary historical sociology. *Historical Methods*, *30*, 4-12.
Isaac, L. W., & Griffin, L. J. (1989). Ahistoricism in time-series analyses of historical process: Critique, redirection and illustrations from U.S. labor history. *American Sociological Review*, *54*, 873-890.

Lerman, P. (1982). *Deinstitutionalization and the welfare state*. New Brunswick, NJ: Rutgers University Press.

Levitt, S. D. (1996). The effect of prison population size on crime rates: Evidence from prison overcrowding litigation. *The Quarterly Journal of Economics*, *111*, 319-351.

Liska, A. E., Markowitz, F. E., Whaley, R. B., & Bellair, P. (1999). Modeling the relationship between the criminal justice and mental health systems. *American Journal of Sociology*, *104*(6), 1744-1775

Listokin, Y. (2003). Does more crime mean more prisoners? An instrumental variables approach. *Journal of Law & Economics*, *46*, 181-206.

Lynch, J. P. (1988). A comparison of prison use in England, Canada, West Germany, and the United States: A limited test of the punitive hypothesis. *The Journal of Criminal Law and Criminology*, *79*, 180-220.

Markowitz, F. E. (2006). Psychiatric hospital capacity, homelessness, and crime and arrest rates. *Criminology*, *44*, 45-72.

McCarthy, B. R. (1990). A micro-level analysis of social structure and social control: Intrastate use of jail and prison confinement. *Justice Quarterly*, *7*, 325-340.

Modlin, H. C. (1979). Medical care in correctional institutions: The AMA project. *Journal of the American Academy of Psychiatry and the Law*, *7*, 118-124.

Ostrom, C. W. (1990). *Time series analysis: Regression techniques*. Newbury Park, CA: SAGE.

Palermo, G. B., Gumz, E. J., & Liska, F. J. (1992). Mental illness and criminal behavior revisited. *International Journal of Offender Therapy and Comparative Criminology*, *36*, 53-61. doi:10.1177/0306624X9203600106

Penrose, L. S. (1939). Mental disease and crime: Outline of a comparative study of European statistics. *British Journal of Medical Psychology*, *18*, 1-15.

Pfaff, J. F. (2008). The empirics of prison growth: A critical review and path forward. *The Journal of Criminal Law and Criminology*, *98*, 547-619.

Raphael, S. (2000). *The deinstitutionalization of the mentally ill and growth in the U.S. prison populations: 1971 to 1996*. (Unpublished manuscript). Retrieved from http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB8QFjAA&url=http%3A%2F%2Fsocrates.berkeley.edu%2F~raphael%2Fraphael2000.pdf&ei=PtvgU5zFKIu3yASL34DgAg&usg=AFQjCNFrE3A4rRIiXPDuRO6kABBRE_6UKw&bvm=bv.72197243,d.aWw.

Raphael, S., & Stoll, M. A. (2013). Assessing the contribution of the deinstitutionalization of the mentally ill to growth in the U.S. incarceration rate. *The Journal of Legal Studies*, *42*, 187-222.

Raphael, S., & Winter-Ebmer, R. (2001). Identifying the effect of unemployment on crime. *Journal of Law & Economics*, *44*, 259-283.

Rauma, D. (1981). Crime and punishment reconsidered: Some comments on Blumstein's stability of punishment hypothesis. *The Journal of Criminal Law and Criminology*, *72*, 1772-1812.

Rothman, D. J. (1971). *The discovery of the asylum: Social order and disorder in the new republic*. Boston, MA: Little, Brown.

Rothman, D. J. (2002). *Conscience and convenience: The asylum and its alternatives in progressive America* (Rev. ed.). New York, NY: Aldine De Gruyter.

Rusche, G., & Kirchheimer, O. (2003). *Punishment and social structure*. New Brunswick, NJ: Transaction Publishers. (Original work published 1939)

Scull, A. T. (1977). Madness and segregative control: The rise of the insane asylum. *Social Problems*, *24*, 337-351.

Scull, A. T. (1984). *Decarceration: Community treatment and the deviant: A radical view*. New Brunswick, NJ: Rutgers University Press.
Segal, S. P., & Aviram, U. (1978). *The mentally ill in community-based sheltered care: A study of community care and social integration*. New York, NY: John Wiley.
Spelman, W. (2000). What recent studies do (and don't) tell us about imprisonment and crime. *Crime and Justice*, *27*, 419-494.
Steadman, H. J., Monahan, J., Duffee, B., Hartstone, E., & Robbins, P. C. (1984). The impact of state mental hospital deinstitutionalization on united states prison populations, 1968-1978. *The Journal of Criminal Law and Criminology*, *75*, 474-490.
Studenmund, A. H. (2001). *Using econometrics: A practical guide*. Boston, MA: Addison Wesley Longman.
Sutton, J. R. (1991). The political economy of madness: The expansion of the asylum in progressive America. *American Sociological Review*, *56*, 665-678.
Tonry, M. H. (2006). *Thinking about crime: Sense and sensibility in American penal culture*. New York, NY: Oxford University Press.
Torrey, E. F. (1988). *Nowhere to go: The tragic odyssey of the homeless mentally ill*. New York, NY: Harper & Row.
Torrey, E. F. (1997). *Out of the shadows: Confronting America's mental illness crisis*. New York, NY: John Wiley.
Wooldridge, J. M. (2006). *Introductory econometrics: A modern approach*. Mason, OH: Thomson South-Western.

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