MENTAL HEALTH AND PUNISHMENT: EXPLORING THE RELATIONSHIP BETWEEN CONTACT WITH THE CRIMINAL JUSTICE SYSTEM AND MENTAL HEALTH

by

TIMOTHY G. EDGEMON

(Under the Direction of Jody Clay-Warner)

ABSTRACT

Past research has considered the ways in which criminal justice contact primarily through incarceration impacts the mental health of individuals, families, and communities. However, prior research has yet to consider how the conditions of confinement impacts mental health net of individual factors and how these conditions of confinement might continue to impact individuals after release. Further, prior research has not yet shown the ways in which mass incarceration as a system of inequality might impact population level mental health. In this dissertation, I add to these important gaps in the literature through three distinct yet related manuscripts. My first manuscript uses hierarchical linear modeling to analyze associations between prison conditions and the mental health of currently incarcerated women net of individual factors. Results indicated that the proportion of inmates who did not receive visits from their children in the last month was positively associated with depression even when controlling for individual child visitation. The second manuscript uses structural equation modeling to show how criminal justice contact through arrest and incarceration impact depression later in the life course and further considers how conditions of confinement impact depression after release. I found that certain conditions of confinement continue to impact

depression after release and that arrest has a durable impact on depression over time. The third manuscript uses ordinary least squares regression to estimate the association between state-level incarceration and state-level mental health for the year 1993-2000. I found significant associations between poorer state-level mental health and the incarceration rate in each state for all years between 1993 and 2000. Taken together, these manuscripts expand upon previous literature and demonstrate the relationship between mental health and criminal justice contact at both the individual and structural levels.

INDEX WORDS: Prison, Deprivation, Mental Health, Prison Conditions, Criminal Justice Contact, Mass Incarceration, *Survey of Inmates in State Correctional Facilities, Census of State and Federal Correctional Facilities, Behavioral Risk Factor Surveillance System*, Hierarchical Linear Models, Structural Equation Models, Confirmatory Factor Analysis

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

From the 1970's and into the 21st century, the United States saw an unprecedented rise in the rates of incarceration. Prior to the 1970's, incarceration rates remained relatively stable if not decreasing slightly. In 1970, there were approximately 140,000 persons incarcerated in prison. By 2014, there were about 1.5 million people incarcerated in prisons (The Sentencing Project 2019). If jail populations are added, then this brings the total number of persons incarcerated in the United States to 2.3 million. In raw numbers, the United States has more people incarcerated than any other country in the world. Given the immense rise in incarceration, contemporary literature has begun to investigate how incarceration can serve as an engine of inequality that contributes to the stratification of American society (Wakefield and Uggen 2010).

Ample empirical literature exists on how incarceration produces and maintains both wealth and racial inequality (Pager 2009; Wakefield and Uggen 2010; Western and Beckett, 1999; Western 2006). In addition, a smaller yet growing body of literature has begun to document the sweeping physical health inequalities that mass incarceration has produced at the individual and population level. For example, Schnittker and John (2007) found that people who are incarcerated report significantly more chronic health problems even when controlling for chronic health problems before incarceration. Interestingly, the authors found that the length of time one is incarcerated has less of an effect on health than does simply being incarcerated.

Similarly, Massoglia (2008) found that incarcerated individuals have disproportionate rates of infectious diseases and stress-related illness when compared to never incarcerated individuals.

In addition to physical health inequalities, the poor mental health of the U.S. inmate population is a significant issue. Over half of inmates incarcerated in state facilities report a mental health condition (James and Glaze 2006). The reported mental health conditions are often serious, as indicated by the large number of inmates taking psychiatric medication (Wilper et al. 2009). Notably, research finds that inmates report higher levels of mental illness and associated symptoms than do those in the general population even when controlling for predisposing factors (Tartaro and Lester 2009), which strongly suggests that the prison environment contributes to the high prevalence of mental health difficulties among the incarcerated population. Research finds that currently incarcerated men are more likely to suffer from major depression than are non-incarcerated men, even when controlling for predisposing factors (Turney, Wildeman, and Schnittker 2012). Further, previous incarceration is also associated with negative mental health outcomes post-incarceration. After controlling for predisposing childhood adversities, Schnittker, Massoglia, and Uggen (2012) reported that incarceration increased risk of depression post-incarceration. Finally, after being released from prison, inmates may suffer mental health consequences as a result of being incarcerated (Baillargeon et al. 2009; Porter and Novisky 2016).

Research has also identified some mechanisms through which incarceration may be linked to negative health outcomes. These include a greater exposure to infectious diseases (Maruschak 2008), incarceration as an acute and chronic stressor (Massoglia 2008; Thoits 1995; Pearlin 1989), and the breakdown of social bonds caused by incarceration (Massoglia and Pridemore 2015; Wilson 1987). Despite this research, the links between incarceration and health

remain relatively unclear, and most past research does a better job demonstrating *that* incarceration matters rather than *why* incarceration matters (Massoglia and Pridemore 2015; Wakefield and Uggen 2010).

Thus, there are still several gaps in understanding the incarceration-health link, and future research on incarceration and health that investigates these multiple pathways is required. For example, it is still unclear how the conditions of confinement might influence health outcomes. It is probably the case that characteristics of the prison environment such as security level, overcrowding, and access to visitation might shape the health outcomes of inmates (Massoglia and Warner 2011; Tartaro and Lester 2009), but little research to date has considered the influence of prison factors on individual health using nested data. Further, research on conditions of confinement have yet to show how these conditions might impact mental health after release (Edgemon and Clay-Warner 2019).

Next, there is still a need for research to explore the influence of other criminal justice processes beyond incarceration, such as arrest, that might also account for the incarceration-health link (Sugie and Turny 2017). Such research would necessarily separate the impact of incarceration from other supervisory measures to elucidate the myriad impacts of the criminal justice system on mental health. It may be the case that being arrested has a unique impact on mental health.

Finally, mass incarceration has been a reality for the American populace for several decades (Western 2006). It has had such a dramatic impact on United States society that it is now becoming understood as another engine of inequality and stratification (Wakefield and Uggen 2010). Having said this, there still remains the question about how the system of mass incarceration has influenced population level mental health (Massoglia and Pridemore 2015). If

indeed mass incarceration has become an engine of inequality and incarceration itself is a potent stressor for the mental health of incarcerated persons and their families (Massoglia and Pridemore 2015) then it should be expected that the system produces dramatic effects on population level mental health. In this dissertation, I expand penological and health literature on the possible mechanisms between incarceration and mental health. I do this in three separate papers that, taken together, examine the impacts that incarceration has on both individual and population mental health.

My first paper examines how the "pains of imprisonment" (Sykes 1958) are associated with the mental health of an understudied population—female inmates. Here, I examine the associations between various prison conditions such as contact with family, the punitiveness of the prison regime, and overcrowding and the mental health of incarcerated women. Previous work has established the associations between prison conditions and negative mental health outcomes for incarcerated men (Edgemon and Clay-Warner 2019), and this paper extends the analysis to women. Importantly, this paper examines a sample of incarcerated women nested inside the prisons in which they reside. Doing so allows me to consider how prison conditions are associated with worsened mental health outcomes net of individual factors. Understanding which prison conditions are associated with negative mental health outcomes for female inmates net of individual factors increases knowledge of how prisons themselves might be impacting the mental health of incarcerated women (Kruttschnitt and Gartner 2012).

My second paper analyzes how contact with the criminal justice system might impact mental health over time as well as how conditions of confinement impact mental health after release. It is the case that criminal justice system interventions encompass more than just incarceration and include arrest, trial, probation, and other supervisory measures. While

previous research has considered the impact of arrest on mental health (Sugie and Turny 2017), there is a need for more research on how contact with the criminal justice system outside of incarceration might influence mental health. To expand understanding of criminal justice contact and mental health, I analyze how both arrest and incarceration might cause depression later in the life course. Importantly, this analysis separates the mental health impact of arrest and incarceration in order to give a better understanding about how incarceration impacts mental health. In addition, I analyze various measures of how negative experiences while incarcerated impact mental health after release. This is important as much of the past research on how conditions of confinement might impact mental health are conducted with currently incarcerated populations (Edgemon and Clay-Warner 2019). There is very little past research that has considered how these conditions of confinement impact the mental health of people after release and later in their life course.

Finally, my third paper offers a more structural level approach to the links between incarceration and mental health. There have been past studies that examine how incarceration impacts population health in terms of infant mortality and infectious diseases rates; however, far less attention has been paid to population mental health. In this article, I examine how incarceration rates from the years of 1993 to 2000 impact population mental health. This analysis offers a foundational understanding of the impact of mass incarceration as a system of inequality on population mental health. This is an important step towards elucidating the ways in which mass incarceration might be impacting the American populace outside of only those who have been incarcerated. Taken together, these papers answer calls to provide a more in-depth understanding of how the criminal justice system and especially incarceration is operating as an engine of health inequity (Massoglia and Pridemore 2015; Wakefield and Uggen 2010).

CHAPTER 2

WOMEN'S MENTAL HEALTH AND THE CONDITIONS OF CONFINMENT[1]

[1] Edgemon, Timothy G and Jody Clay-Warner. To be submitted to *Justice Quarterly*

ABSTACT

Research on incarceration and mental health has tended to focus exclusively on male inmates. However, previous research indicates that women experience prison differently than do men. Thus, it is important to examine how prisons impact women's mental health. To this end, we use national data on 1,490 female state inmates and the 60 state prisons in which they reside to examine how prison conditions are associated with mental health symptoms, net of individual-level factors. Hierarchal linear models indicated that prison factors such as overcrowding and the availability of work assignments are not significantly related to depression or hostility. However, the proportion of inmates who did not receive visits from their children in the last month was positively associated with depression even when controlling for individual child visitation. In addition, inmates reported higher levels of hostility when the prison did not allow television. Consonant with previous research, these results suggests the importance that visitation plays on female inmate well-being. This has important implications for future research that attempts to understand the mechanisms through which prison deprivations are linked to female inmates' mental health.

INTRODUCTION

The extraordinary increase in women's incarceration over the past quarter century is well-documented. The number of women incarcerated in the United States tripled during the 1980s incarceration boom, largely due to changes in drug laws (Church 1992; Immarigeon and Chesney-Lind 1992). This escalation has continued, with the number of incarcerated women increasing by more than 700% between 1980 and 2014 (The Sentencing Project). Today there are more than 225,000 women incarcerated in U.S. prisons and jails (The Sentencing Project).

The increase in women's incarceration rate has brought attention to the unique circumstances of women's incarceration. As many as 80% of the women confined in prisons are mothers (Casy-Acevedo and Bakken 2002), and the number of minor children who have an incarcerated mother has more than doubled since 1991 (Glaze and Maruschak 2015). Yet, because there are fewer correctional facilities for women than there are for men, women are more likely to be housed far from their home (Pollack 2002), which makes visitation more difficult. Indeed, incarcerated mothers are less likely to receive visits from their children than are incarcerated fathers (Arditti and Few 2006). This is particularly problematic for incarcerated women, as they seem to suffer more from family separation than do incarcerated men (Casey-Acevedo and Bakken 2002). In addition to the unique challenges of visitation, women also face unique challenges with the punitive prison environment. It has been shown that incarcerated women are more likely to be cited for minor conduct infractions than are men, which can lead to severe punishments such as solitary isolation and the loss of privileges (U.S. Commission On Civil Rights 2020).

Women's prisons are also marked by high rates of poor mental health. While there are high rates of mental health problems, overall, in the correctional system, rates are even higher for

incarcerated women than for incarcerated men (James and Glaze 2006). Available data suggest that the most commonly occurring mental health problems for incarcerated women involved substance abuse and depression (Teplin et al., 1996). Indeed, around 80% of women involved with the criminal justice system report a history of substance abuse and co-occurring mental health disorders (James and Glaze 2006).

Here, we examine the relationship between the poor mental health of incarcerated women and the conditions of their confinement. We contend that unique conditions that incarcerated women face, such as few family visits and an overly punitive prison environment, contribute to mental health difficulties for female inmates. In constructing our arguments, we reflect on previous research findings for men's mental health in prison (Edgemon and Clay-Warner 2018). However, women's prisons are considerably different in organization than are men's prisons, and women enter prison with a different set of pre-incarcerative experiences than do men, such as higher rates of physical and sexual abuse (Kruttschnitt and Gartner 2003). Men and women also face different gender role expectations and constraints, which affect their reactions to the prison environment and interactions with prison staff (e.g., Britton 2003). Thus, we draw heavily from research on women's prisons and on women's prison experiences (e.g., Aiello and McCorkel 2018; Dye and Aday 2013; Liebling 1992;) in proposing gender-informed modeling of how prison conditions are associated with women's mental health.

In order to understand which particular institutional characteristics are most associated with poor mental health among female inmates, we analyze data from the *2004 Survey of Inmates in State Correctional Facilities* (SISCF) in combination with data from the *2000 Census of State and Federal Correctional Facilities* (CCF). This combined dataset allows us to examine the relationship between institutional characteristics and mental health net of individual risk

factors, which follows previous research on incarcerated men drawn from these data (Edgemon and Clay-Warner 2018). We are particularly interested in the role of visitation and punitiveness in shaping women's mental health outcomes, given the considerable research suggesting the importance of visitation for incarcerated women and the higher levels of punitiveness that incarcerated women face (Aiello and McCorkel 2018; Britton 2003). By using national data, focusing on visitation and punitiveness, while also including both prison- and individual-level characteristics that previous research has found to be associated with incarcerated men's mental health, we provide new insight into the circumstances of women's poor mental health during the period of incarceration.

BACKGROUND

Mental health is a serious and pervasive issue in the American system of mass incarceration. Rates of mental illness are higher among incarcerated women than in the general population of women in the United States (Fazel and Danesh 2002; Fazel and Baillargeon 2011; Prins 2014). In fact, nearly three-quarters of incarcerated women report a mental health condition (Bureau of Justice Statistics 2006). In addition, incarcerated women display high rates of major depressive disorder and suicide attempts (Maeve 1999; Miller 1994). Thus, it is not only that most female inmates report poor mental health, but a sizable proportion of women in prison also have severe mental health conditions and/or have attempted suicide.

There is no doubt that individual-level characteristics that often precede incarceration, such as trauma histories, economic instability, family conflict, and substance abuse influence the mental health state of incarcerated women (Liebling 1992). However, research also suggests that conditions of confinement might influence the mental health of women (Liebling 2006). This research demonstrates the necessity of isolating the prison-level factors that predict inmate

mental health, net of individual-level factors. Very little research on women in prison, though, has done this. Thus, we review the broader literature that focuses either on prison-level characteristics and mental health or individual-level characteristics and mental health among the incarcerated population. We also highlight related literature – such as on prison suicide – that accounts for both individual- and institutional- level factors in cross-sectional analyses.

Prison-Level Factors

Classic works by Sykes (1958) and Goffman (1961) suggest that prisons are depersonalizing and stigmatizing in a number of ways (see Schnittker and John 2007). Recent work builds on this classic research to better specify how the "pains of imprisonment" exert themselves upon the inmate (e.g., Dye 2010; Edgemon and Clay-Warner 2019). These studies primarily utilize a deprivation model and focus on environmental factors, such as overcrowding, use of solitary isolation, and family contact, to explain variation in mental health among incarcerated individuals. This research focuses exclusively on incarcerated men, however, and so the implications of this research for incarcerated women's mental health is unclear. The broader literature on incarcerated women, though, provides several insights, as discussed below.

Visitation

First, the extent to which the prison allows and facilitates family contact may have an impact on female inmate mental health. Research suggests that separation from children has a particularly profound effect on incarcerated women (Liebling 1994; Owen 1998; Pollack 2002; Wood and Grasmick 1999). For example, Liebling (1994) found that while male inmates reported boredom and bullying as the most psychologically difficult aspects of incarceration, women reported separation from family and children as the most psychologically difficult. This is particularly important because, as previously noted, the majority of women in prison have

minor children and the number of children whose mothers are incarcerated has more than doubled since 1991 (Casey-Acevedo and Bakken 2002; Glaze and Maruschak 2015).

The issue of visitation is also particularly salient for women, as incarcerated mothers receive fewer visits from their children than do incarcerated fathers (Arditti and Few 2006). There are several reasons why this is the case. For one, women tend to be confined at a greater distance from their families than are men (Pollack 2002), which likely impacts visitation, since families who live far away from the prison are less able to visit (Casey-Acevedo and Bakken 2002). In fact, Bloom (1993) found that over half of incarcerated women reported that their children had never visited them, with distance between the child's home and the prison as the most frequently cited reason for the lack of visitation.

A number of studies suggest the importance of child visitation for incarcerated mothers' well-being. First, past research has documented the ways that visitation supports pro-social bonding between the mother and the child, and how on-going sustained visitation throughout the term of incarceration helps to maintain these bonds (Lazzari, Miller, and Lee 2019; Salisbury and Van Voorhis 2009). Child visitation is associated with many positive outcomes, including reduced recidivism (Beckmeyer and Arditti 2014), better social adjustment both during the period of incarceration and after release (Casey-Acevedo and Bakken 2002), and higher levels of pro-social behavior during the period of incarceration (Ellis 1974). As previously noted, however, incarceration often severs women's relationships with their children, and visitation can be difficult to achieve (Casey-Acevedo and Bakken 2002). The inability of incarcerated mothers to visit with children has been shown to have severe psychological consequences for these mothers (Banauch 1985; Mears, Cochran, Siennick, & Bales, 2012; Wood and Grasmick 1999)

While there are some qualitative studies on visitation and incarcerated women's mental health (Liebling 1999), there is little quantitative research that has directly examined the relationship between receiving visits from children and incarcerated women's mental health and none that use a national sample. Here we not only test for this relationship, but we also consider the ways in which the rates of inmates receiving visits from children is associated with mental health of the prison residents as a whole, including women who are not mothers. This multi-level approach considers the interactional dynamics in the prison as well as the ways in which overall prison culture is affected by inmates' inability to see their children.

Punitiveness

The level of punitiveness in the prison environment might also be associated with worsened mental health among inmates (Sykes 1958; Weinberg 1942). In women's prisons, punitiveness is often expressed as violations for minor rule infractions, and the large number of these violations have particularly strong implications for women. Previous research suggests that female inmates face more scrutiny for minor infractions than do men (Britton 2003; Compton-Wallace 2003). In a study of prisoners in Texas, McClellan (1994) found that women were significantly more likely than men to be cited for rule infractions, especially minor ones (see also Girshick 1999). A recent federal report by the United Commission on Civil Rights (2020) supports much of this previous research, finding that incarcerated women are more likely than are men to receive disciplinary citations for minor offenses. These minor offenses include swearing, talking back, and being disobedient.

Not only are women more frequently cited for minor rule infractions, but they also receive particularly severe penalties for these infractions (Britton 2003; Compton-Wallace 2003). Recent research corroborates these findings, as the U.S. Commission on Civil Rights (2020)

report similarly details the harsh consequences that incarcerated women face for minor rule infractions, including losing the privilege to purchase items from the prison commissary, the loss of good conduct credits, and solitary confinement. These penalties for rather innocuous behavior represent a particular deprivation for women in prison where they are heavily policed for insubordinate action (McClellan 1994).

Thus, the punitive nature of women's prisons might be a factor in the high rates of poor mental health among incarcerated women. For male inmates, a punitive environment may contribute to overall stress and contribute to hyper-sensitivity, which could make them more hostile or depressed (Wienburg 1942). Edgemon and Clay-Warner (2019) found a positive relationship between heightened levels of punitiveness and individual depression and hostility among male inmates net of individual factors. However, there is a lack of research on the relationship between punitivity and incarcerated women's mental health.

Other Prison Conditions and Mental Health

There are other prison conditions that also might be associated with women's poor mental health while incarcerated. Activity deprivation and boredom caused by poor availability of work-related assignments and the absence of meaningful recreational activities has been linked to worsened mental health for men (Cunningham, Reidy, and Sorensen 2016; Tartoro and Lester 2009). However, there has been little research on how lack of activity might affect women in prison. This paucity is concerning, as activity deprivation may be a particularly important issue for incarcerated women, since women's prisons typically offer fewer recreational and vocational activities than do men's prisons (U.S. Commission on Civil Rights 2020). Finally, overcrowding has been consistently found to have mental health consequences for incarcerated populations, especially when overcrowding persists for a long period of time (Gaes 1985).

Overcrowding can result in increased levels of stress and decreased psychological well-being (Lawrence and Andrews 2004; Cox et al. 1984). Haney (2006) argues that overcrowded conditions may amplify the "cognitive strain" that inmates experience while incarcerated. Overcrowding could also strain already scarce medical and vocational resources (Themeli 2006). Since women's facilities tend to be even more overcrowded than are men's facilities (Grossman 1992; Sharkey 2010), overcrowding is likely to be a particularly important factor in incarcerated women's mental health.

Individual Risk Factors

Just as with women in the general population, the mental health of incarcerated women is also predicted by individual-level risk factors. Controlling for these relevant individual-level characteristics is especially important in examining mental health among incarcerated women, because women who find themselves incarcerated have a disproportionate number of risk factors that predispose them to mental health conditions (Green et al. 2008; Reingle, Jennings, and Maldonado-Molina 2012). For example, women who are incarcerated have experienced a large number of traumatic life events (Farley and Kelly 2000), and such trauma is associated with depressive symptomology (Arboleda-Florez and Wade 2001).

There are also various demographic characteristics that might predict inmate mental health. Racial and ethnic patterns in the mental health of inmates (including suicide) are similar to patterns in the general population (Brown 2003). Specifically, there is an overrepresentation of white inmates with mental disorders and an under-representation of Black and Hispanic inmate among those who have committed/attempted suicide (Toch 1992). In a study of suicides in a New York state prison, Kovasznay et al. (2004) found that 28% of those who committed suicide were white even though whites only made up 16% of the correctional population.

Further, a national-level report by the Bureau of Justice Statistics found that white inmates were more likely to complete suicide than were Black or Hispanic inmates (Mumola 2005). It is not clear why white inmates have a higher suicide rate, though some scholars suggest that the systematic mass incarceration of people of color has normalized the prison experience for Black men, resulting in stronger social networks in prison and the development of better coping strategies (Western 2006). Due to this normalization, deprivations may be experienced differently for Black male inmates than for white male inmates. Far less, though, is known about racial and ethnic differences in suicide and mental health for incarcerated women.

Age is also an important indicator of mental health. While the onset of mood disorders, certain anxiety disorders, and suicide mortality in the general population typically occurs after adolescence and early adulthood (WHO 2004; WHO 2007), these patterns do not hold true for the inmate population. In fact, studies identify younger inmates as being more at risk for depressive symptoms and suicide than are older offenders (Mumola 2005; Way et al. 2005).

In addition, traumatic life experiences are associated with inmate depression and depressive outcomes, such as suicide (Arboleda-Florez and Wade 2001; Johnson et al. 2002). Considering the influence of traumatic life experiences is especially important for women in prison, as the majority of women in prison have encountered traumatic life events. Indeed, a 1999 report by the BJS detailed that sixty percent of female inmates have experienced some form of physical or sexual victimization prior to incarceration (Greenfield and Snell 1999). In a nationally representative sample of state and federal inmates, Leigey and Reed (2010) found that 70% of non-life sentenced female inmates reported a history of physical victimization and 40% reported a history of sexual victimization. These percentages were even higher among female lifers. Research finds that while both physical and sexual victimization predispose female

inmates to mental health difficulties, and the effect of sexual victimization on mental health is particularly strong (Verona, Hicks, and Patrick 2005; Aday et al. 2014).

Current Study

While previous research finds that incarceration has negative effects on male inmate's mental health (Turney, Wildeman, and Schnittker 2012), little is known about how particular prison characteristics affect women's mental health. Documenting the relationship between prison characteristics and women's mental health net of common predisposing factors is the first step in determining whether and how prisons shape women's mental health while incarcerated. Most of the existing literature on the mental health of incarcerated women either neglects to control for individual-level characteristics that predispose one to mental health difficulties (Craig 2006; Fraser, Gatherer, and Hayton 2009; Hayton 2009) or fails to isolate specific prison conditions (Arboleda-Florez and Wade 2001; Johnson et al. 2002; Laishes 1997). Large scale studies on prison suicide capture a narrow band of mental health conditions, typically consider prison suicide at the aggregate level, and are conducted on male prison populations (e.g., Huey and McNulty 2005; Dye 2010). Most research on suicide in women's prisons are small-scale qualitative studies that do not account for the wide variation in prison conditions (Dye and Aday 2013).

Our study is the first to combine prison- and individual-level data to examine associations between specific prison characteristics and mental health in a national sample of incarcerated women. In this study, we analyze two forms of mental distress, depression and hostility, and isolate a number of prison characteristics, with a focus on family visitation and punitiveness. We control for a host of individual characteristics that may predispose one to mental distress, such as physical and sexual victimization, alcohol abuse, and pre-incarceration SES, as well as age and

race. In addition, we also control for prison security level. We describe our data in depth below and then discuss analytic strategy.

DATA AND METHODS

Data

The data for this study are drawn from two sources: the *2004 Survey of Inmates in State Correctional Facilities* (SISCF) and the *2000 Census of State and Federal Correctional Facilities* (CCF). The SISCF has been collected periodically by the Bureau of Justice Statistics since 1974. These data contain individual-level information on a national sample of state inmates. The total sample size of the 2004 SISCF is approximately 14,500 state inmates selected from 1,585 state prisons. Information was collected through individual survey administration interviews with each inmate, and this dataset represents the largest available sample of U.S. state inmates in existence. For this paper, we utilize the sample of female inmates from the SISCF (n=2,931). Pertinent to our analysis, the SISCF contains information on the mental health of individual inmates, as well as many of the individual-level and, through aggregate estimation, institutional-level predictors of mental health identified in the literature. While the SISCF does not contain pre-incarceration measures of mental health, we are able to control for a number of pre-disposing factors. Mental health measures in the SISCF were measured via a series of questions asking about psychological experiences within the past year. Because of this, we only include inmates who have been incarcerated for at least a year (n = 1,905) in order to better represent the impact of prison deprivation

In addition, we also utilize data from the *2000 Census of State and Federal Correctional Facilities* (CCF). The CCF is a longitudinal survey of U.S. prisons, sponsored by the U.S. Department of Justice and the Bureau of Justice Statistics and conducted by the U.S. Census Bureau. The CCF contains data on the characteristics of federal, state, and private adult

correctional facilities, including prisons, prison farms, state-operated local detention facilities, reception/diagnostic/classification centers, vocational training facilities, and correctional drug/alcohol treatment facilities. Important for this paper, the CCF has information on overcrowding and security level of all state prisons, which are key institutional-level variables missing from the SISCF.

We merge data from the SISCF and the CCF via a common indicator that appears in both data sets: population count of the prison. Because population count data in the SISCF was drawn directly from the CCF, it is possible to match on this variable. However, due to duplicate population counts in the CCF, some cases could not be identified by this method. For example, if individual X was in a prison with a population count of 500 inmates and there were three prisons with a population of 500 in the Census, then it would be impossible to determine in which of these three prisons individual X resided. When this occurred, we dropped the case from analysis. In total, 390 cases out of the original 1,905 cases were dropped for this reason, leaving data on 1,515 inmates available for potential analysis.

Among these 1,515 cases, 48 had data missing on at least one variable. Missing data were primarily clustered between two individual level variables: whether the inmate had ever been homeless and whether the inmate had been employed before arrest. Demographic characteristics such as race and age and even questions of experiences with physical and sexual victimization had relatively few missing data. None of the cases had missing data on the prison characteristics variables, as these data were reported by the institution.

Missing response data were handled through maximum likelihood estimation (MLE). Maximum likelihood is a procedure wherein the set of values of the model parameters that maximize the likelihood function are selected through imputation. Simply put, maximum

likelihood estimates the parameter values that make the observed data most likely. Here, maximum likelihood looks at larger patterns in the available data to produce estimates of the missing values. This gives a unified approach to estimation (Myung 2002). This approach left a final sample of 1,490 female inmates. Again, for each case, the combined dataset provides individual-level information gathered from each inmate along with prison-level data reported by the institution.

Measures

Dependent Variables: Depression and Hostility

Our dependent variables measure current depression and hostility. These observed values come from responses to eight items in a mental health screening administered to each inmate during the SISCF interviews. This screening was adapted from the referral decision scale (Teplin and Swartz 1989) and contains 22 questions designed to measure mental health conditions of inmates within the past year. Each question has a yes or no response category. Two scales were created—one for depression and one for hostility. The depression scale has an alpha score of .73 while the hostility scale has an alpha of .78. The depression scale is comprised of the following four questions:

1. In the past year, have you had difficulty feeling close to friends or family members?
2. In the past year, have you given up hope for your life or your future?
3. In the past year, have there been periods when you felt like no one cares about you?
4. In the past year, have there been periods when you felt numb or empty inside?

The hostility scale is comprised of the following four questions:

1. Have you lost your temper easily, or had a short fuse more often than usual?
2. Have you been angry more often than usual?
3. Have you hurt or broken things on purpose, just because you were angry?
4. Have you thought a lot about getting back at someone you have been angry at?

Focal Deprivation Variables: Visitation and Punitiveness

The primary independent variables of interest are two indicators of deprivation that the research literature suggests should be important for incarcerated women: child visitation and the punitiveness of the prison environment.

No Visitation is a prison-level variable representing the proportion of women within each prison that did not receive a visit from her child within the last month. This measure was created by aggregating the individual-level responses at each prison. Only women who had children were included in the computation of this scale. However, as an institutional level measure, *No Visitation* allows us to see the environmental impact of visitation deprivation for all women in the prison, including those who do not have children.

Infractions is a prison-level variable measure representing the proportion of women in each prison that have been charged with rule infractions within the last month. These infractions only include write-ups for minor offenses, which reflects the level of punitiveness of the prison (Edgemon and Clay-Warner 2019).

Other Deprivation Variables

We also include other measures of deprivation such as overcrowding, proportion of inmates that reside a significant distance from the prison, whether television is allowed in the prison, rate of work assignments, and whether a suicide was recently committed in the prison.

For the *overcrowding* measure, we computed a standardized index similar to the measure constructed by Huey and McNulty (2005). This index includes (a) the ratio of the number of inmates to the number of correctional staff in the prison, and (b) the ratio of the total number of inmates to the design capacity of the prison. These ratios were summed and then standardized to

achieve a scale of overcrowding. Here, higher scores on the scale reflect a greater level of overcrowding.

Next, *Great Distance* is a prison-level measure representing the proportion of women within each prison that are more than 50 miles from their pre-incarceration residence. This is included to account for the effects that physical distance from home might have on mental health independent of the effect that distance from home has on mental health through reduced ability of family to visit.

We also include measures of activity deprivation. As suggested by the literature, the boredom created by not having a work assignment or not having access to recreational activities can lead to worsened mental health states (Cunningham, Reidy, and Sorensen 2016; Liebling 1992; Meldicott 2001). Therefore, we utilize two different variables to measure activity deprivation, both measured at the institutional-level. *No Television* is a measure of whether televisions are allowed (coded 0 and 1), while *Work assignments* indicates the proportion of individuals in the prison who have a work assignment.

Suicide is coded "1" if a suicide occurred in the prison in the last year. A suicide occurring recently indicates a more deprived environment (Tartaro and Lester 2009) and may, itself, increase distress.

Individual-level Control Variables

We control for eleven individual-level characteristics, all drawn from the SISCF: race, age, history of physical abuse, history of sexual abuse, employment prior to incarceration, residential status before incarceration, alcohol abuse, solitary isolation, child visitation, and minor infractions. The variable *Black* is a dichotomous variable comparing White inmates with Black inmates with Black coded as "1". *Age* is the recorded age of the inmate at the time of the

interview. History of *physical abuse* is coded "1" if the inmate indicated in the SISCF that she experienced physical abuse prior to incarceration. Similarly, history of *sexual abuse* is operationalized as a question asking whether the inmate experienced sexual abuse prior to incarceration, with "no" as the reference category.

Unemployed is coded "1" if the respondent indicated unemployment in the month before being incarcerated. *Homeless* is coded "1" if the inmate indicated in the SISCF that she was homeless the month before being incarcerated. Both homelessness before arrest and employment status before arrest have been shown to be associated with mental health (James and Glaze 2006; Greenberg and Rosenheck 2008). Next, *alcohol abuse* is a factor computed from 11 survey questions. These 11 items measure the level of alcohol dependency and abuse by the individual prior to incarceration. Questions included: "During the year before your admission to prison, did you more than once want to cut down on your drinking or try to cut down on your drinking but found you couldn't do it?"; "During the year before your admission to prison, did you lose a job because of your drinking?"; "Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?"; "Have people ever annoyed you by criticizing your drinking?"; An exploratory factor analysis (EFA) showed that all items loaded on a common factor (the lowest loading was .94) and the alpha was .98. For the scale, higher values indicate higher levels of alcohol abuse and dependency prior to incarceration. Next, *religious engagement* is an individual-level variable coded "1" if an inmate reported participating in religious services offered in the prison within the last month. Finally, *solitary isolation* is coded as "1" if the inmate reported being placed into solitary isolation for any length of time during their sentence.

We also include a measure for security level in order to control for the effects that different security levels have on prisoner visitation and other deprivation variables. This dummy variable compares minimum security institutions with all other types of institutions, which is in line with previous research demonstrating that there are greater differences in deprivation between minimum security institutions and all others (Adams 1992; Liebling, 1999; Salive, Smith, and Brewer, 1989).

Finally, we include a three-category dummy variable at the individual level which measures whether or not the inmate has a child and whether or not the inmate receives visits from their child. The three categories of this variable are "Inmate has a child that visits," "Inmate has a child that does not visit," and "Inmate does not have a child." *Child Does not Visit* measures whether the inmate's child has visited them at least once in the last month and is coded as "1" for women whose child has not visited at least once in the last month. *No Children* asks whether the inmate has a child under the age of 18 and is coded "1" for women who do not have children. "Inmate does not have a child" is the left-out category.

Analytic Strategy

We conduct hierarchal linear modeling (HLM) analysis with inmates nested within prisons. In these models, inmate characteristics and experiences are entered as level 1 variables, and prison environmental conditions are entered as level 2 variables. We employ this strategy for several reasons. First, HLM was designed to examine multilevel factors and can account for autocorrelation due to clustering (Raudenbush and Bryk, 2002), which is particularly important for this study as several of our variables have been aggregated from the individual level and there is thus a danger that bias might be clustered at the individual level. HLM accounts for this clustering by treating level 2 effects as random. Four different HLM models were performed—

two for depression and two for hostility. The first models include all level 1 variables in order to estimate the effect that these individual variables have on mental health. The second models step add in all level 2 variables and offer the final estimation. As stated, all level prison level variables were modeled as random effects. Again, the final sample is 1,490 female inmates residing in 60 prisons.

FINDINGS

Descriptive Statistics

Table 2.1 presents descriptive statistics for the sample. Proportions are reported for dichotomous variables, while means and standard deviations are reported for scale level variables. There is a greater proportion of whites in the sample than blacks (.47 vs. .42), and the average age of the inmates is 36 (sd=9.93). Blacks make up a slightly higher proportion of the female inmate population than do whites (Harrison and Beck 2006), while in our sample there are slightly more whites than Blacks. Finally, 93% of the women in the sample indicated having at least one child under the age of 18.

Depression

Table 2.2 presents the results of the HLM for inmate depression in two separate models. Taken together, these models are intended to demonstrate the impact of aggregate child visitation and aggregate rule violations on individual inmate depression. The first model contains all relevant level 1 variables. The second model steps in all of the level 2 variables to offer a contextual analysis of how prison conditions are associated with individual mental health net of individual factors. Model 2 is the full model for this analysis.

Table 2.1. Descriptive Statistics – Means (SD), and Proportions

Race	
White	0.47
Black	0.42
Other	0.11
Age	36.0 (9.93)
Physical Abuse	0.50
Sexual Abuse	0.44
Unemployed	0.39
Homeless Before Prison	0.12
Alcohol Dependence	0.17 (.31)
Minimum Security Level	0.77
Overcrowded	0.00 (1)
No Child Visitation	0.77 (.12)
No Television	0.1
Work Assignments	0.32 (.46)
Recent Suicide in Prison	0.10
Great Distance	0.85 (.17)
Rule Infractions	0.50 (.19)
Solitary Confinement	0.11
Final Sample of Inmates	n=1,490
Number of Prisons	N=60

In the full model, inmates who indicated a history of physical abuse prior to incarceration had higher levels of depression ($\beta = .08$; $p<.01$), as did inmates who had been sexually abused prior to incarceration ($\beta = .09$; $p<.01$). *Age* was negatively associated with depression among the women ($\beta = -.004$; $p<.01$). Higher levels of depression were also associated with unemployment in the month prior to incarceration ($\beta = .03$; $p<.05$) and with being homeless prior to incarceration ($\beta = .08$; $p<.01$). As expected, higher levels of alcohol dependence before incarceration were associated with greater depression ($\beta = .10$; $p<.01$). Women who indicated being placed in solitary isolation within the last year displayed higher levels of depression than women who were not placed in isolation ($\beta = .05$; $p<.05$). Finally, women who did not receive visits from their child within the last month showed higher levels of depressive symptoms than

did inmates whose child visited within the last month (β = .05; p<.05) Women who did not have children also had higher levels of depressive symptoms than did without a visit from their child (β = .08; p<.05).

Table 2.2. HLM Results for Depression

	Model 1 (Only level 1 variables)	Model 2 (Full Model with level 2 variables)
Level 1 - Individual		
Child Does Not Visit	.05**	.06*
Does Not Have Child	.06**	.08**
Written Up For Rule Infractions	.07**	.05*
Physical Abuse	.09**	.08**
Sexual Abuse	.10**	.09**
Age	-.004**	-.004**
Black	.02	.03
Unemployed	.04*	.03**
Homeless	.08**	.08**
Alcohol Dependence	.10**	10**
Solitary Confinement	.07**	.05**
Level 2 Prison		
No Child Visitation	-	.23**
Punitiveness	-	.12
Minimum Security	-	.009
Overcrowding	-	.004
Distance	-	.003
Work Assignments	-	.002
No Television	-	.06
Suicide	-	.01

n=1490; N=60; * p<.05; ** p<.01

Regarding level 2 effects, prison-level child visitation, individuals residing in prisons with a higher the proportion of inmates who did not receive visits from their children had higher levels of depression than did women residing in prisons where more women received visits from children. Notably, the prison-level effect is significant even when controlling for visitation at the individual level (β = .23; p<.01). However, prison-level rule violations was not significantly associated with individual depression suggesting that conditions of visitation are perhaps more

salient on individual depression health than are conditions of punitiveness. There were no significant effects for the proportion of inmates more than 50 miles from their home residence, whether television was allowed, whether there was a recent prison suicide, the number of prisoners with work assignments, or overcrowding on levels of inmate depression.

Hostility

Table 3 presents the results of the HLM for inmate depression in two separate models. Taken together, these models are intended to demonstrate the impact of aggregate child visitation and aggregate rule violations on individual inmate hostility. The first model contains all relevant individual-level variables. The second model adds all prison-level variables and represents the full model.

Regarding the full model, women who indicated having been sexually abused prior to incarceration have higher levels of hostility than women who were not ($\beta = .14$; $p<.01$). Similar to depression, age was negatively associated with levels of hostility ($\beta = -.006$; $p<.01$). Unlike with depression, Blacks had higher levels of hostility than did Whites ($\beta = .06$; $p>.01$). Higher levels of hostility were associated with experiencing homelessness prior to incarceration ($\beta = .08$; $p<.01$). Higher levels of alcohol dependence and abuse prior to incarceration were also associated with higher levels of hostility ($\beta = .09$; $p<.01$). Finally, inmates who indicated being placed in solitary isolation within the last year showed higher levels of hostility than inmates who were not placed in isolation ($\beta = .08$; $p<.01$). Prior physical abuse and experience with unemployment before incarceration were not significantly associated with hostility. Further, women who have a child that does not visit were not significantly different in their hostility level than women who have a child that does visit, and women who do not have children were not significantly different in their hostility levels than women who have a child that visits.

Table 2.3. HLM Results for Hostility

	Model 1 (Only level 1 variables)	Model 2 (Full Model with level 2 variables)
Level 1 - Individual		
Child Does Not Visit	.03	.03
Does Not Have Child	.04	.04
Written Up For Rule Infractions	.13**	.09**
Physical Abuse	.03	.03
Sexual Abuse	.08**	.08**
Age	-.005**	-.006**
Black	.04*	.06**
Unemployed	.02	.02
Homeless	.07**	.08**
Alcohol Dependence	.08**	.09**
Solitary Confinement	.08**	.08**
Level 2 Prison		
No Child Visitation	-	.09
Punitiveness	-	.04
Minimum Security	-	.01
Overcrowding	-	.002
Distance	-	.05
Work Assignments	-	.01
No Television	-	.08*
Suicide	-	.02

n=1490; N=60; * p<.05; ** p<.01

Neither prison-level child visitation nor prison-level rule violations were significantly related to inmate hostility after controlling for these effects at the individual level. Interestingly, inmates who resided in facilities where television is not allowed reported higher levels of hostility than inmates in facilities where television is allowed ($\beta = .08$; $p<.05$). There were also no significant effects for the proportion of inmates more than 50 miles from their home residence, whether there was a recent prison suicide, the number of prisoners with work assignments, or overcrowding on levels of inmate hostility.

Summary

Our hierarchical linear models indicate that there are institutional level characteristics associated with mental health among the sample of incarcerated women. One characteristic—child visitation—was significantly associated with depression even when controlling for lack of child visitation at the individual level, suggesting a particularly meaningful relationship between visitation and overall inmate psychological functioning. Punitiveness was only associated with depression and hostility at the individual level. Finally, lack of access to television—a proxy for inmate boredom—was associated only with inmate hostility

DISCUSSION

While there is a large literature documenting how women's prison experience differs from men's, there has been little published about how incarcerated women's mental health might be associated with these unique aspects of the prison experience (Liebling 1992, 1995; Kruttschnitt and Gartner 2003). As is also the case with men's prisons, women's prisons vary in their levels of deprivations (Clear and Frost 2013; Liebling 1992; Sykes 1958). Thus, if high rates of poor mental health in women's prisons are a function of the unique deprivations that women in prison experience, then we would expect that women who reside in prisons where these deprivations are more severe will experience higher levels of psychological distress than female inmates in less depriving environments. In this study, we combined individual-level data on female inmates available through the SISCF with institutional-level prison data available through the CCF in order to better document the association between institutional-level factors and depression and hostility among currently incarcerated women. We focus on visits with children and punitiveness, since literature suggests that these are significant issues in women's prisons. Our multilevel models controlled for predisposing individual-level factors that could

confound the relationship between prison characteristics and mental health, as well as several prison-level factors that have been found to be associated with mental health of male inmates (Dye 2010).

Our central finding is that lack of visitation from children was significantly associated with depression. Specifically, we found that the proportion of women in a given prison who do not receive visits from their children is positively associated with depressive symptoms. Interestingly, because this is an aggregate effect, it represents the average environmental effect that deprivation of visitation has on all women in the prison facility -- even on those who do not have children. Even more surprising, however, is the magnitude of the institutional-level effect of child visitation, which is similar to the magnitude of an individual histories of physical and sexual abuse. A previous study utilizing the same dataset only with the sample of male inmates did not find a significant relationship between visitation and depression and hostility (Edgemon and Clay-Warner 2018) even when controlling for individual effects. Thus, we believe this finding underscores the importance that visitation plays in the overall deprivation of the prison environment for women.

Our findings on punitiveness are somewhat mixed. Punitiveness at the prison level is significantly related to both depression and hostility for women before controlling for punitiveness at the individual level. However, prison level punitiveness loses its significance on both mental health indicators when individual level punitiveness is stepped into the models. This implies that punitive actions from the correctional staff might illicit both depression and hostility for individual inmates, but that punitive regimes of the prison might have a muted effect. The lack of an institutional level association might be due to a lack of variation. Previous literature on women's prisons has documented the often arbitrary nature of punishments in most women's

prisons (Britton 2003). Indeed, a recent federal report by the United Commission on Civil Rights (2020) indicates that most women's prisons tend to have arbitrarily punitive regimes, which suggests that this may be the accepted reality of women's prisons. Having said this, our study is one of the first to document empirically the relationship between punitive measures and individual mental health among incarcerated women.

Finally, it is the case that many of our prison-level variables were not significantly associated with either depression or hostility for female inmates, which is notably different from a previous analysis of mental health indicators among male inmates using the same data (Edgemon and Clay-Warner 2019). That study found that overcrowding and punitiveness were significantly associated with increased depression and hostility for male inmates, while the availability of work assignments was negatively associated with both mental indicators net of individual characteristics. As already mentioned, however, neither structural-level nor individual-level visitation was significantly associated with depression or hostility for male inmates. The differences between these structural level associations with mental indicators between men and women may point to real differences between men's and women's prisons that cannot be totally captured by the variation in individual experience. This further reinforces the notion that women's prisons are unique in many ways from men's prisons and demand further investigation at the structural level.

Speaking to this demand, our findings both complement and expand previous literature on women's prisons and the mental health of incarcerated women. The often severe mental health conditions of many incarcerated women has been well documented (Bureau of Justice Statistics 2006). Studies have shown that suicide ideation is a reality for some incarcerated women (Dye 2010) and that depression is prevalent (Singleton, Meltzer, and Gatward 1998).

Unfortunately, a systematic investigation of depression among incarcerated women is lacking especially in terms of how prison conditions might impact the depression of incarcerated women (Kruttschnitt and Gardner 2012). Much of the literature on women's experiences with prison and mental health are qualitative, and while such studies offer a rich analysis of how women individually experience prison and the effect that these experiences can have at the individual level (Harner and Riley 2013), they cannot capture the institutional impact of the prison environment on individual mental health. Our study attempts to fill this gap in the literature by showing how variations in prisons conditions are associated with both the depression and hostility of incarcerated women while controlling for individual factors. Our findings answer calls for a more institutional-level investigations of women's prisons on how the environment of the prison might impact women's experiences net of their individual life histories (Kruttschnitt and Gardner 2003).

Limitations and Directions for Future Research

While our research provides an important look at the connections between the prison environment and female inmate mental health, there are significant limitations that should be addressed in future research. Perhaps the most important limitation of this study is that neither the SISCF nor the CCF contain longitudinal measures of inmate mental health. Thus, we cannot establish causal connections between prison deprivations and inmate mental health as we do not have measures of mental health prior to incarceration. However, we did limit our analysis to women who have been incarcerated in a particular prison for at least one year. Thus, our measures of prison deprivations clearly precede the mental health symptoms reported at the time of survey. We also control for a large number of factors that predispose one to poor mental health. However, we cannot make claims about changes in mental health over time.

Next, our measures of prison deprivations are limited to those available in the SISCF and CCF, meaning that some prison characteristics are not included in our analysis. In particular, we do not have measures of social support within the prison. Previous research on women in prison suggests that the social connections and support that incarcerated women offer each other is important for the overall prison experience for women (Banauch 1985; Mears, Cochran, Siennick, & Bales, 2012; Wood and Grasmick 1999). The inclusion of social support variables might not change the core findings of our study, but it would offer a more complete view of the multitude of factors that likely affect incarcerated women's mental health.

Despite these limitations, our study offers a unique view of female inmate mental health. Our findings contribute to previous literature concerning women in prison by demonstrating how visitation matters not only from an individual-level perspective but also from a structural perspective. This is also one of the first studies to combine both individual- and prison-level variables for a sample of incarcerated women. By analyzing which prison characteristics are associated with higher levels of depression and hostility net of individual level factors, we highlight the role that prison structure may play in women's wellbeing while incarcerated and, more generally, the relationship between social structure and women's health.

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CHAPTER 3

ARREST, INCARCERATION, AND DEPRESSION: IMPACTS OF CONTACT WITH THE AMERICAN CRIMINAL JUSTICE SYSTEM ON MENTAL HEALTH ACROSS TIME[2]

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ABSTACT

It has been well documented that incarceration has a negative impact on mental health outcomes, and these effects might continue throughout the life course. However, little is known about how contact with the criminal justice system outside of incarceration might influence mental health. For example, arrest alone may have serious consequences for later mental health. Further, there has been virtually no research that considers how conditions of confinement might impact mental health after release. To expand understanding of criminal justice contact and mental health, I analyze how both arrest and incarceration independently might cause depression later in the life course using longitudinal data from a 20-year study of several hundred African Americans individuals. In addition, I analyze how various conditions of confinement might affect an individual after being released. Findings indicate that being arrested has a durable impact on depression over time; however, incarceration does not seem to exert a durable impact on depression over time. Further, various conditions of confinement have significant associations with worsened mental health after release. In all, future research aimed at uncovering the impacts that the criminal justice system has upon individual trajectories of mental health should consider how these distinct processes operate.

INTRODUCTION

As rates of incarceration have skyrocketed in recent decades within the United States, it has been widely established that incarceration is associated with poor mental and physical health (Massoglia 2008). Incarceration has been shown to increase depression (Turney, Wildeman, and Schnittker 2012) and it is clear that incarcerated persons have a high rate of current psychiatric disorders (Schnittker, Massoglia , and Uggen 2012). The mental health impacts of being incarcerated likely persist after release and continue to impact people throughout the life course (Porter and Novisky 2016). It is also the case that ever-incarcerated persons have higher mortality rates and stress related infectious diseases relative to the never incarcerated population (Patterson 2010; Massoglia 2008).

However, what is less understood about the incarceration-health link is how the conditions of incarceration impact health after release. It has been documented that these conditions of confinement—or "pains of imprisonment" (Sykes 1958)—are associated with mental health problems for incarcerated individuals. For example, Edgemon and Clay-Warner (2019) found that prison conditions such as overcrowding and the availability of work assignments in prisons are significantly associated with depression even when controlling for predisposing factors. Similarly, Dye (2010) found that conditions of confinement such as overcrowding and increased violence in the prison significantly predicted prison suicides. To date, there has been little research conducted on how these conditions of confinement might continue to impact health after release, as most studies of health post-release and health do not consider these conditions and instead measure incarceration has a dichotomous variable (Porter and Novisky 2016).

In addition to incarceration, there is a growing body of literature that has examined the effects of other contacts with the criminal justice system, such as arrest, on health (Sugie and Turney 2017). This literature on criminal justice contact beyond incarceration and health is essential as the number of arrests outpace the number of incarcerations in the United States (Glaze and Heberman 2013) as not every arrest will lead to a period of incarceration. This fact has led scholars to criticize the sole focus on incarceration when studying the impact of the criminal justice system on health and especially in regards to mental health (Sewell and Jefferson 2016; Sugie and Turney 2017). As with incarceration, understanding the durable impacts of the arrest experience is vital towards elucidating the picture of how the criminal justice system is contributing to health inequality. Thus, comparing the effects of incarceration on health over time with the effects of arrest on health over time is important, as it would further expand empirical literature on the exact process of how the criminal justice system impacts health.

In order to better understand the process by which the criminal justice system impacts mental health across time, I use longitudinal data from the Family and Community Health Study (FACHS), a 20-year study of several hundred African American individuals who were 10 years of age when the study began. Three different waves of data are used, which allows me to track the impact of criminal justice contact on mental health and consider multiple ways in which criminal justice contact might impact the mental health of individuals. First, I analyze how being arrested influences the mental health of people after the initial arrest incident has passed. Next, I analyze how being incarcerated might also impact the mental health of individuals after they have been released. Finally, I answer calls in the literature to consider how the various conditions of confinement experienced by incarcerated individuals might continue to impact their mental health after release and later in life.

BACKGROUND

As mass incarceration has continued to impact American society in the last several decades, there are numerous individuals that currently are or have been incarcerated at some point. At any given time, there are around 1.2 million persons incarcerated in prisons throughout the country (Sentencing Project 2019). However, this number does not remain static throughout the year as people continually flow in and out of the prison system. Most people will be released from prison at some point with one estimate detailing that more than 700,000 people are released from prison each year (West and Sabol 2009). Given this dramatic in-flow and out-flow of incarcerated persons, Uggen, Manza, and Thompson (2006) estimated that around 7.5% of the U.S. population are either currently incarcerated or have been incarcerated at some point in their life.

While the numbers of persons that are currently or have been incarcerated are staggering, the numbers of persons arrested in any given year greatly outpaces incarcerations. According to the UCR, there were approximately 8,402,881 arrests made for index crimes alone (Uniform Crime Report 2019). Estimates from 2013 indicate that around 12.2 million individuals are arrested annually (U.S. Department of Justice 2013). Further, population level demographics estimate that by age 23, between 30 and 41 percent of persons have been arrested—however, many of these individuals are not ultimately convicted of a crime (Brame et al. 2012). Thus, it is clear that incarceration numbers only make a small proportion of the total number of persons that come into contact with the criminal justice system each year.

Arrest and Health:

As noted, arrests represent the most frequent form of criminal justice contact for individuals, far outpacing incarceration (Sugie and Turney 2017). Given the incredible amount of

arrests each year in relation to the numbers of people actually convicted and then incarcerated, it is imperative that arrests be considered in the overall health consequences for criminal justice contact. Indeed, several scholars have suggested that neglecting to consider arrest in past research on criminal justice contact and health has resulted in the underestimation of the impacts that criminal justice contact has on health (Sewell and Jefferson 2016; Sugie and Turney 2017).

Much of the previous literature on arrest and health has focused primarily on the mental health consequences of arrest. There are several reasons why arrest may serve as a potent stressor for mental health problems. For one, arrest necessarily involves police contact. This contact can involve stressful events such as the searching and violation of one's person and property as well as the person receiving derogatory and divisive remarks from the police (Brunson and Weitzer 2009). As part of their larger study on individuals who have passed through the criminal justice system, Lerman and Weaver (2014) found that police contact through arrest often leaves people feeling alienated and without control.

Next, arrest carries with it a certain amount of uncertainty about the future. The person who is arrested may not readily know what will result from their arrest. An arrest could result in several court appearances, a period of probation, or carry with it jail or prison time and a lengthy trial (Kohler-Hausmann 2013). Further, arrest can illicit unknown and costly fines, fees, and surcharges that the person might struggle to pay back (Harris 2016). This level of uncertainty can foster extreme feelings of stress and have detrimental impacts on one's mental health (Sugie and Turner 2017). Indeed, in their large-scale quantitative analysis of criminal justice contact and mental health, Sugie and Turney (2017) found a robust and significant relationship between being arrested and poorer mental health. The authors purpose that this is a primary stressor due to the uncertainty that arrest can illicit.

Third, an arrest can present a serious time-burden on the arrested individual that can result in a number of consequences related to mental health. Arrests can remove people from their daily habits and rituals while forcing the person to temporality adapt to the demands of the criminal justice system (Fernandes 2020). Court appearances and the general adjudication process create a "procedural hassle" (Kohler-Hausmann 2013) forcing people to constantly keep a schedule of court appearances in order to avoid the more serious consequences that being arrested might pose. All of this adds a layer of stress to the life of the arrested individual and this stress is itself often exacerbated by the experience of criminal justice contact (Schnittker and John 2007).

Finally, being arrested can carry with it a certain amount of stigma. While past literature on criminal justice contact and stigma has typically focused on the burden of criminal records of the recently incarcerated, there is some research which suggests that minor criminal records such as being arrested can create similar burdens (Lerman and Weaver 2014). Ispa-Landa and Loeffler (2016) conducted in-depth interviews with persons who have extensive criminal records and those who have minor criminal records. They found that people who have minor criminal records faced similar stigma as those people who have more extensive criminal records including problems associated with housing and employment opportunities. In addition, both groups expressed frustration with the enduring reality of their criminal justice records. Relatedly, in a quantitative analysis of criminal justice contact and mental health, Fernandes (2020) found a substantial impact of arrest on deleterious mental health outcomes, speculating that these outcomes are primarily due to the challenges for employment and housing that being arrested poses.

Incarceration, Health, and the Pains of Imprisonment

Poor inmate mental health has significant consequences for prisons and for events that happen after release. First, there are relatively high institutional costs associated with poor inmate mental health. Inmates with poor mental health seemingly have higher rates of misconduct and accidents in prison (Fellner 2006; James and Glaze 2006), and correctional officers often claim difficulty in handling inmates with poor mental health (Britton 2003). Thus, a high population of mentally ill inmates strain already scarce prison resources (Urban Institute 2015). Consonant with this, the budgets for state correctional institutions grew an average of about 8 percent each year between 1998 and 2001, with mental health care costs listed as the major contributors to this trend (Kinsella 2004). In addition, a growing literature documents the association between poor mental health in prison and negative post-incarceration outcomes of former inmates. Inmates with mental health problems have higher recidivism rates (Baillargeon et al, 2009), higher rates of criminal involvement, as well as poorer housing and employment outcomes (Mallik-Kane and Visher 2008).

In general, studies that analyze how prison characteristics influence health use a deprivation model. Drawing from classic work by Sykes (1958) and Goffman (1961), the deprivation model assumes that prisons and other custodial facilities are depersonalizing in several ways. Studies utilizing a deprivation model focus on factors that contribute to the depriving environment of the prison, such as prison overcrowding, prison security level, solitary isolation, relationships with staff, and family contact to explain variation in mental health among incarcerated individuals (Dye 2010; Huey and McNulty 2005; Liebling 1992). For example, chronic overcrowding has been linked to a wide array of physical and mental health consequences for inmates (Gaes 1985). Overcrowding has been linked to increased levels of

stress and decreased psychological well-being, as well as prison suicide (Lawrence and Andrews, 2004; Innes, 1987; Cox et al. 1984), and overcrowding might further impact the effect of prison conditions on mental health. Thus, Huey and McNulty (2005) found that minimum security institutions—which typically have low suicide rates—were as likely to experience a suicide as maximum-security prisons when at high levels of overcrowding.

There is also empirical research on inmate mental health that includes measures for both individual- and institutional- level characteristics in the same models. For example, Liebling (2006) conducted surveys with inmates and correctional staff within 12 U.K. prisons in order to better understand the relationship between individual experiences, prison setting, and prisoner distress. Liebling addressed vulnerabilities to suicide such as previous psychiatric treatment and previous suicide attempt. In all, her analysis revealed that deprivation indicators explained 45 percent of prisoner distress while the pre-prison vulnerability measures explained between 8 and 15 percent of prisoner distress. Edgemon and Clay-Warner (2019) utilized a sample of male inmates nested within several state prisons and found that prison deprivations such as overcrowding and the level of punitiveness were significantly associated with poorer mental health among the incarcerated men even after controlling for individual factors.

It is perhaps not surprising that the deprivations of prison confinement can exert themselves upon the physical health outcomes of inmates as well. Of particular importance here is the relationship between inmates and correctional officers on the one hand and the length of incarceration on the other. In many cases, inmates suffering from a chronic illness are left in the care of untrained correctional officers (Fluery-Steiner 2015). While some correctional officers may go to great lengths to care for chronically ill inmates (Fluery-Stiner 2015), it more often seems to be the case that correctional officers are indifferent to inmate health needs (Brown v.

Plata, 2011). Prisons are required by law to provide inmates with medical care. However, any inmate that challenges their health needs via the prison's grievance system may be ignored, or in many cases, may face retaliation by correctional officers (Fluery-Stiner 2015). In a recent study of the grievance system in California prisons, 61 percent of inmates interviewed raised the issue of fear of retaliation by correctional staff when utilizing the grievance system (Calavita & Jenness 2015).

Further, tensions between chronically ill inmates and correctional officers may be compounded by time spent incarcerated and by age of the inmate. Given the increase in sentencing time in America due to mandatory sentencing laws and "three strikes you're out" policies (Reimen and Leighton 2013), inmates may spend an incredible amount of time behind bars. This has led to the development of a particular group of inmates known as lifers (those inmates who spend the majority of their life in prison either on a life sentence or an incredibly long prison sentence). During the long period of time spent incarcerated, inmates may develop several chronic illnesses that require increased medical care (Aday 2003). However, there is a strong likelihood that elderly inmates will not receive the comprehensive medical care that is required (Aday 2003). In a two year study of aging prisoners in the U.K., Crawley and Sparks (2005) discovered that correctional officers would often resent having to offer special medical care to elderly inmates such as bathing and assisting with general movement. They argue that the relationship between older inmates and correctional officers is often fraught with stigma, shame, and fear on the part of the inmate. While the current analysis does not assess the impact of incarceration on physical health, it is nonetheless important to recognize the impact that incarceration might have on the physical health of incarcerated individuals.

Post Release and Health

It is clear that inmates suffer considerable health consequences during the period of incarceration. However, there is still the question of whether or not being incarcerated continues to negatively impact both mental and physical health after release. More than 700,000 people leave prison each year (West & Sabol,2007), and about half of these will be re-incarcerated within 3 years (Langan & Levin 2002). Given this large number of individuals that are shifting back into society, knowing how being incarcerated produces health disparities is a relevant concern for public health and for society in general. Empirical research in this area has demonstrated that incarceration is related to later mental and physical health problems after release.

Poor mental health in prison has been linked with continued mental and physical health difficulties post-incarceration (Baillargeon et al., 2009; Schnittker, Massoglia, and Uggen 2012; Porter and Novisky 2016). For example, Porter and Novisky (2016) examined the association between incarceration and depressive symptoms among a representative sample of young adults in the U.S. In all, they found a positive relationship between being incarcerated and later depressive symptomology. Further, the authors found that this association was explained primarily by high levels of material hardship among ex-inmates. This study thus explored the potential links between incarceration and mental health. Schnittker, Massoglia, and Uggen (2012) sought to disentangle the effect of incarceration on different types of mental disorders. The authors found a robust and long-lasting relationship between mood disorders such as major depressive disorder and experiencing incarceration. This finding did not hold for other types of mental disorders indicating that incarceration might have a special and relevant link to the development of mood disorders that persists after being released.

Current Study

While previous research has demonstrated a rather robust link between previous incarceration and later health difficulties, there is virtually no research that analyzes how the pains of imprisonment specifically impact health after release and later in the life course. As noted, most literature on incarceration and health after release typically only considers ever being incarcerated without exploring how the period of incarceration was experienced. Being incarcerated is a dynamic and varied experience and the later health impacts of incarceration are likely influenced by the conditions of confinement that were experienced (Clear and Frost 2014). On the other hand, past research that does consider how conditions of confinement might impact health are typically conducted with currently incarcerated populations and do not consider how these impacts carry over after the persons are released (Dye and Aday 2013; Edgemon and Clay-Warner 2019). Thus, there is a need for research which considers how the conditions of confinement during the incarceration period might modify the ways in which the incarceration experience impacts later mental health. In this paper, I consider not only how being incarcerated impacts mental health across time, but also how the conditions of confinement might negatively impact mental health after the person has been released. Further, I consider how arrest might impact mental health over time in order to better estimate the impact of criminal justice contact on mental health.

DATA AND METHODS

Data

This study utilizes waves 5, 6, and 7 of the Family and Community Health Study (FACHS), a multi-site (Georgia and Iowa) investigation of neighborhood and family processes that contribute to African American children's development in families living in a wide variety

of community settings (see Gibbons et al. 2004; Simons et al. 2002). The sample consists of several hundred African American families residing in Georgia and Iowa at the beginning of the study. Families were recruited from neighborhoods that varied on racial composition (percent African American) and economic level (percent of families with children living below the poverty line) (Simons et al, in progress).

Wave 5 was gathered in 2007-2008, and wave 6 was gathered in 2011-2012. Age in wave 5 ranged from 21-22 and ranged from 24-25 in wave 6. Of the initial 889 targets interviewed at wave 1, 687 were re-interviewed at wave 5, and 699 at wave 6 (78% of the original sample). Incarceration and arrest are first measured at wave 5 and thus this was the wave selected for analysis in the current study. I selected waves 6 and 7 to measure later levels of depression in order to test if criminal justice contact has a durable effect on health over time.

Dependent Variables

Depression is primary dependent variable at waves 5, 6, and 7. Depression is computed for all waves via confirmatory factor analysis from questions intended to measure feelings of depression and sadness. The same questions were posed to the target at both waves 5 and 6. The factor is comprised of the following 13 questions:

1. In the past year, was there ever a two week period when you felt sad, empty, or depressed most of the day?
2. In the past year, was there ever a two week period when you lost interest in things?
3. In the past year, was there ever a two week period when you woke up at least two hours before you wanted to?
4. In the past year, was there ever a two week period when you slept too much almost every day?
5. In the past year, was there ever a two week period when you couldn't sit still and paced up and down or couldn't keep your hands still when sitting?
6. In the past year, was there ever a two week period when you felt worthless nearly every day?
7. In the past year, was there ever a two week period when you felt guilty?

8. In the past year, was there ever a two week period when you felt like you were not as good as other people?
9. In the past year, was there ever a two week period when you had so little self-confidence that you wouldn't try to have your say about anything?
10. In the past year, was there ever a two week period when you were a lot less interested in sex than usual?
11. In the past year, was there ever a two week period when you lost the ability to enjoy having good things happen to you, like winning something or being praised or complimented?
12. In the past year, was there ever a two week period when you thought a lot about death?
13. In the past year, was there ever a two week period when you were so depressed or sad that it interfered with your ability to do your job, take care of your house or family, or take care of yourself?

Each question had a "yes" or "no" category with yes indicating depression. Initial alpha tests at each wave revealed that the questions seem to comprise a single factor ($\alpha = .85$ at wave 5 and $\alpha = .89$ at wave 6). Two separate CFA's were performed for each wave. Table 3.1 summarizes the results of the CFA's. Factor loadings for depression at wave 5 range from .40 to .69 while factors loadings for depression at wave 6 range from .47 to .75. Both CFA's have acceptable model fit. Overall, these constructs seem to be a valid measure of depression at both waves.

Wave 7 has a slightly different set of questions that measure depression. While the number of questions in wave 7 is different, the content of the questions remains the same. Altogether, there are seven questions that comprise the depression factor at wave 7:

1. In the past year, was there ever a two week period when you felt sad, empty, or depressed most of the day?
2. In the past year, was there ever a two week period when you lost interest in things?
3. In the past year, was there ever a two week period when you woke up at least two hours before you wanted to?
4. In the past year, was there ever a two week period when you couldn't sit still and paced up and down or couldn't keep your hands still when sitting?
5. In the past year, was there ever a two week period when you lost the ability to enjoy having good things happen to you, like winning something or being praised or complimented?
6. In the past year, was there ever a two week period when you were so depressed or sad that it interfered with your ability to do your job, take care of your house or family, or take care of yourself?

7. In the past year, was there ever a two week period when you felt worthless nearly every day?

Each question had a "yes" or "no" category with yes indicating depression. Initial alpha tests at wave 7 revealed that the questions seem to comprise a single factor (α =.85). As with the first two waves, I performed a CFA for depression at wave 7. Table 3.2 summarizes the results of this CFA for depression at wave 7. Factor loadings for depression at wave 7 range from .56 to .83 and the model has an acceptable model fit. As with waves 5 and 6, this construct seems to be a valid measure of depression at wave 7.

Table. 3.1 CFA of Depression – Factor Loadings and Model Fit for Waves 5 and 6

	Wave 5	Wave 6
Q1	.62	.67
Q2	.62	.62
Q3	.41	.48
Q4	.40	.50
Q5	.51	.57
Q6	.66	.75
Q7	.59	.69
Q8	.67	.74
Q9	.69	.73
Q10	.46	.47
Q11	.67	.73
Q12	.42	.52
Q13	.61	.67
	Chi-Square= 210.378; CFI = .94; TLI = .93; RMSEA = .05; SRMR = .036	Chi-square = 357.961; CFI = .904; TLI = .885; RMSEA = .087; SRMR = .050

Table. 3.2 CFA of Depression – Factor Loadings and Model Fit for Wave 7

	Wave 7
Q1	.83
Q2	.81
Q3	.56
Q4	.58
Q5	.69
Q6	.64
Q7	.72
Chi-Square= 223.67; CFI = .86; TLI = .80; RMSEA = .176; SRMR = .060	

Independent Variables

There are two primary predictors used in the initial models analyzing criminal justice contact and depression: arrest and incarceration. Both are measured at wave 5. Arrest is a dichotomous response question asking the individual if they have ever been arrested for any reason. Responses of "yes" are coded as 1. Next, incarceration is operationalized as a dichotomous response question asking the individual if they have ever been incarcerated in prison or jail for any length of time. Responses of "yes" were coded as 1. While both measures are blunt, they do provide a valid measure of contact with the criminal justice system at varying levels. Thus, using both as independent indicators gives some insight into how different phases of the criminal justice process might differentially impact the individual.

In order to better estimate the impacts that experiences during incarceration might have on a person's mental health after release, I run additional models using several independent indicators of prison deprivations that the target may have experienced during their incarceration experience. While these experiences are asked at the individual level, they do give some

information about how depriving the incarceration experience was for each individual. These questions were asked of all individuals at wave 6 that had indicated spending at least some time in prison or jail. Specifically, there are 15 prison deprivation indicators.

First, *Length of Time Incarcerated* is operationalized as the number of months each person spent incarcerated. This is an important measure of deprivation as past research details how lengthy can negatively impact mental health (Porter and DeMarco 2019). Next, *Property Stolen* measures whether the individual had personal property either stolen or vandalized without the use of force while incarcerated. This is a dichotomous measure with "1" indicating that the person had their property stolen. Related to this, *Forced Seizure of Property* is a dichotomous measure asking if the person had personal property taken from them by force or intimidation while incarcerated with "1" indicating that the person experienced this violent act. *Officer Destroyed Property* is a variable measuring whether or not a correctional officer destroyed or confiscated property that the individual was legitimately allowed to possess while incarcerated with "1" indicting that an officer committed this action against the individual.

Next, *Threatened with Violence* asks if the individual was ever threatened with violence while incarcerated with "1" indicating that the person was threatened with violence. *Involved in Fights* measures if the asks if the individual was personally involved in any physical fights while incarcerated with "1" indicating that the person was involved in at least one physical fight during the period of incarceration. Next, *Witness Stealing* measures if the individual witnessed another inmate's property being stolen or vandalized while incarcerated with "1" indicating that the respondent did witness this event. *Witness Assault* asks if the respondent witnessed other inmates being assaulted with a weapon either by other inmates or correctional staff with "1" indicating that the respondent did witness assault with a weapon. *Witness Fight* measures if the inmate

witnessed any other inmates involved in physical fights either with other inmates or with correctional staff with "1" indicating that the respondent did witness physical fights. Next, *Did Not Receive Visits* asks if the respondent received any visits from family or friends on the outside while incarcerated with "1" indicating that the person did not receive visits. Finally, *Did Not Receive Phone Calls* measures whether or not the respondent spoke by phone to family or friends on the outside while incarcerated with "1" indicating that the respondent did not speak on the phone with family or friends.

Controls Variables

Several control variables were included in the models. First, I control for respondent sex. This was reported at wave 5 and is dichotomized with female coded as 1. Next, past research has shown that violent victimization is associated with depression (Liebling 1992). Therefore, being a victim of a violent crime was included in both models. This was measured as a dichotomous variable at wave 5. A person's living situation can also impact their depression. People who live alone seem to be more depressed than people who live with family or a significant other, and marital status might also impact depression (Tataro and Lester 2012). Thus, whether the person lives alone or not, and the person's marital status was controlled for in the models. Marital status is dichotomized as married versus not married and is reported for waves 5, 6, and 7. Next, being unemployed for any length of time might impact depression and thus unemployment was measured at each wave via questions asking if the respondent had been unemployed at any point in time within the last 12 month. Finally, previous research has suggested that those who lack a high school diploma might demonstrate greater levels of depression (Porter and Novisky 2016). Therefore, education was included in the models and was measured by a question asking whether or not the respondent has a high school diploma at wave 5.

Analytical Strategy

This study utilizes structural level modeling techniques (SEM) with three CFA's measured over time. Three separate models were estimated—one for arrest, one for incarceration, and one for conditions of confinement. For the arrest and incarceration models, the primary independent variables were measured at wave 5 and regressed on depression at wave 5, depression at wave 6, and depression at wave 7. Since previous research shows that depression at an earlier time point is typically predictive of depression at a later time point (Porter and Novisky, 2016), autoresgression was used such that depression at wave 5 is allowed to predict depression at waves 6 and 7 in both models. For the conditions of confinement model, the primary independent variables were measured at wave 6 and regressed on depression at waves 6 and 7. These models were only conducted with persons who had been incarcerated. Here, the sample is 273. All controls for the arrest and incarceration models are also included in this model. Again, autoregression was used in order for depression at wave 6 to predict depression at wave 7.

Missing data on responses was handled through full maximum likelihood estimation (FIML). Maximum likelihood is an imputation procedure wherein the set of values of the model parameters that maximize the likelihood function are selected. Put simply, maximum likelihood attempts to find the parameter values that make the observed data most likely (Myung 2002). The finale sample size is 609 for the arrest and incarceration models. For the conditions of confinement model, the sample size is 273.

Descriptive Statistics

Table 3.3 presents descriptive statistics for the sample. Proportions are reported for all dichotomous variables. As is shown, 58% of the sample is female and around 5% have been the

victim of a violent crime by wave 5. Next, about 15% of the sample lived alone at wave 5, about 18% lived alone at wave 6, and about 19% lived alone at wave 7. For education, aboutt 87% of the sample has at least a high school diploma at wave 5. The proportion of the sample who are married increases with each subsequent wave with around 18% of the sample being married by wave 7. The proportion of the sample who indicate being unemployed within the last 12 months does decrease with each subsequent wave with 38% of the sample indicating some time of unemployment in wave 5 and 24% of the sample indicating some time of unemployment in wave 7. For the two primary independent variables, almost 30% of the sample had been arrested by wave 5 and 21% of the sample had been incarcerated by wave 5.

Table 3.3 Descriptive Statistics

Female (wv5)	.58
Victim of Violent Crime (wv5)	.05
Living Alone (wv5)	.15
Living Alone (wv6)	.18
Living Alone (wv7)	.19
High School Diploma (wv5)	.87
Married (wv5)	.04
Married (wv6)	.05
Married (wv7)	.18
Unemployed (wv5)	.38
Unemployed (wv6)	.36
Unemployed (wv7)	.24
Incarcerated (wv5)	.21
Arrest (wv5)	.30
Final Sample	N=609

Findings –Incarceration and Arrest

Table 3.4 presents the model for incarceration while Table 4 presents the model for arrest. All results have been standardized. As is shown in table 3, being incarcerated at wave 5 is positively associated with depression at wave 5 ($\beta = .203$; $p<.01$). However, incarceration is not significantly associated with depression at wave 6 ($\beta = -.044$; $p=.27$) suggesting that any effect that incarceration has on depression disappears by wave 6. This remains the case for wave

7 (β = -.051; p=.27), again suggesting that incarceration does not have a durable impact on depression. Looking at the controls, being female is positively associated with depression at wave 5 (β = .21; p<.01) as is being the victim of a violent crime at wave 5 (β = .08; p<.05). Experiencing unemployment within the last 12 months is also positively associated with depression (β = .118; p<.05). However, these variables lose their significance when predicting depression at wave 6. In terms of the autoregression, depression at wave 5 does significantly predict depression at wave 6 (β = .59; p<.01) and at wave 7 (β = .38; p<.01). In fact, depression at wave 5 is the only variable that significantly predicts depression at wave 6 and depression at wave 7. While the model fit is worse than expected, it is still acceptable (chi-square = 1205.415; CFI = .86; TLI = .87; RMSEA = .056; SRMR = .048).

Table 3.4. Standardized SEM Results for Incarceration Predicting Depression at Wave 5, Wave 6, and Wave 7

	Depression – Wave 5		Depression – Wave 6		Depression – Wave 7	
	β	S.E.	β	S.E.	β	S.E.
Incarceration	.203**	.04	-.044	.04	-.051	.05
Female	.208**	.04	-.042	.04	.072	.05
Victim of Violent Crime	.084*	.04	.026	.05	.023	.05
Living Alone	.009	.45	-.025	.03	-.012	.04
Education	-.012	.04	.000	.04	.012	.05
Married	.01	.04	-.014	.04	-.073	.04
Unemployed	.117*	.05	.016	.05	.082	.06
Depression Wave 5	-	-	.589**	.03	.388**	.05

N=609 for all waves; * p<.05; ** p<.01

Table 3.5. Standardized SEM Results for Arrest Predicting Depression at Wave 5, Wave 6, and Wave 7

	Depression – Wave 5		Depression – Wave 6		Depression – Wave 7	
	β	S.E.	β	S.E.	β	S.E.
Arrest	.206**	.04	.113*	.04	.033	.05
Female	.218**	.04	.082*	.03	.062	.05
Victim of Violent Crime	.082+	.03	.021	.04	.021	.05
Living Alone	.015	.05	-.025	.04	-.014	.04
Education	-.021	.04	-.023	.04	.036	.04
Married	.011	.04	-.037	.04	-.061	.05
Unemployed	.116*	.05	.04	.05	.043	.05
Depression Wave 5	-	-	.581**	.04	.388**	.05

N=609 for all waves; * p<.05; ** p<.01

As shown in table 3.5, being arrested at wave 5 is positively associated with depression at wave 5 (β = .205; p<.01). Unlike with incarceration, being arrested at wave 5 does significantly predict depression at wave 6 (β = .113; p<.05). This suggests that being arrested may have a more durable impact on depression over time compared to being incarcerated. Being arrested, however, does not have a significant effect on depression at wave 7. This may suggest that the impact of arrest on individual depression might dissipate with enough time. For the control variables, being female is positively associated with depression at wave 5 (β = .22; p<.01) while being the victim of a violent crime at wave 5 is approaching significance (β = .08; p<.10). While being the victim of a violent crime loses its significance when predicting depression at wave 6, being female still significantly predicts depression at wave 6 (β = .08; p<.05) but is no longer

significant at wave 7. Unemployment is also significantly associated with depression at wave 5 ($\beta = .116$; $p<.05$); however, unemployment does not predict depression at wave 6 or wave 7. All other controls are non-significant at both waves. In terms of the autoregression, depression at wave 5 does significantly predict depression at wave 6 ($\beta = .59$; $p<.01$). As with the incarceration model, the model fit is worse than expected, but it is still acceptable (chi-square = 1200.868; CFI = .86; TLI = .89; RMSEA = .056; SRMR = .049).

Conditions of Confinement

Table 3.6 summarizes the results for the conditions of confinement on depression at wave 6 and at wave 7. As is shown, there are two conditions of confinement that are significantly associated with depression at wave 6, and one condition of confinement that is approaching significance. As a reminder, these questions were posed to targets that have experienced incarceration, but who had been released prior to the implementation of the survey. First, being threatened with violence while incarcerated is significantly associated with increased individual depression ($\beta = .214$; $p<.05$). In addition, having a correctional officer purposely destroy or vandalize personal property is approaching significance ($\beta = .156$; $p<.10$). No other measures of direct experiences with violence or with witnessing violence while incarcerated are significantly related to depression. Next, not receiving phone calls while incarcerated is also significantly associated with increased individual depression ($\beta = .227$; $p<.05$). Interestingly, not receiving visits from family members is not significantly related to depression. In terms of controls, being female is significantly related to depression ($\beta = .231$; $p<.05$) as is being a victim of a violent crime ($\beta = .06$; $p<.05$). Finally, having experienced a period of unemployment prior to the survey is also significantly related to depression ($\beta = .120$; $p<.05$)

Table 3.6. Standardized SEM Results for Conditions of Confinement Predicting Depression at Wave 6 and Wave 7

	Depression – Wave 6		Depression – Wave 7	
	β	S.E.	β	S.E.
Length of Time Incarcerated	.03	.09	.082	.09
Property Stolen	.124	.09	-.063	.08
Forced Seizure of Property	.008	.09	-.173	.09
Officer Destroyed Property	.156+	.06	.151	.10
Threatened with Violence	.214*	.06	.092	.07
Involved in Fights	-.098	.07	.098	.06
Witness Stealing	.124	.08	-.064	.10
Witness Assault	.113	.09	.054	.11
Witness Fight	.122	.08	.102	.12
Did not Receive Visits	-.007	.105	-.104	.10
Did not Receive Phone Calls	.227*	.06	.136	.09
Female	.231*	.04	.256*	.04
Victim of Violent Crime	.06*	.04	.05*	.05
Living Alone	.02	.05	.123	.03
Education	.03	.04	-.125	.06
Married	.03	.04	.125	.6
Unemployed	.120*	.05	.042	.06
Depression Wave 6	-	-	.597**	.07

N = 273 for both waves; * p<.05; ** p<.01

For wave 7, it is shown that none of the conditions of confinement are significantly related to depression at wave 7. In terms of controls, being female is significantly related to depression at wave 7 ($\beta = .256$; $p<.05$) as is being a victim of a violent crime ($\beta = .05$; $p<.05$). Depression at wave 6 does significantly predict depression at wave 7 ($\beta = .597$; $p<.01$). The model does have acceptable fit (chi-square = 1102.868; CFI = .83; TLI = .87; RMSEA = .068)

DISCUSSION

Results for all three models are somewhat mixed. For incarceration, I find that having been incarcerated is significantly associated with depression at wave 5 but does not retain its significance on depression at wave 6 or at wave 7. On the other hand, arrest is significant for depression at both waves 5 and 6 but does not retain significance at wave 7. The model testing for conditions of confinement has mixed results such that receiving threats of violence, not receiving phone calls from family, and having correctional officers purposefully destroy personal property are all significantly related to elevated level of depression at wave 6. However, these conditions of confinement do not significantly predict depression at wave 7.

In terms of incarceration, previous research suggests that being incarcerated does have durable impacts on depression over time (Porter and Novisky 2016). While I do find a positive and significant association between incarceration and depression at wave 5, I do not find evidence of a durable effect of incarceration, in contrast to previous literature. There are perhaps multiple reasons why incarceration does not predict depression over time in this study. For one, it could be the case that incarceration's effect on depression is completely mediated by depression at wave 5. Thus, any impact that it would have at later waves is washed out in the model. In order to account for this, I ran a separate SEM that estimated the impact of incarceration at wave 5 on depression at wave 6 without controlling for previous depression at 5.

Even when depression at wave 5 is not included, incarceration still did not have a significant association with depression at wave 6. I did the same for depression at wave 7 and found a similar result. Thus, it does not seem to be the case that incarceration's effect on depression is completely mediated by depression at wave 5.

Next, it may be the case that incarceration does not have a durable impact due to limitations in the survey and in the sample. The measure for incarceration is a blunt instrument. As noted, it asks the respondent if they have ever been to jail or prison. It does not, therefore, distinguish between being incarcerated in jail and being incarcerated in prison. This could be a relevant distinction, as prisons and jails are separate institutions that may exert themselves in different ways upon the individual. It may the case that having been incarcerated in prison has a durable impact on depression over time, whereas being incarcerated in a jail does not. These nuanced effects are impossible to determine due to the measure of incarceration in the survey. The conditions of confinement models were intended to somewhat alleviate this limitation.

Looking at the models for arrest, being arrested is significantly associated with depression at wave 5 and also significantly predicts depression at wave 6. Thus, arrest seems to exert a somewhat durable impact on depression that incarceration does not. There are several reasons why arrest might be impacting depression over time. As mentioned, when someone is arrested, they are exposed to public scrutiny, and the intense reaction by the community can create a level of stigma that is hard to overcome (Ispa-Landa and Loeffler 2016). The continued stigma of the arrest event might impair the individual's mental health as they try to escape the negative ramifications of the arrest event. The additional time burdens (Fernandes 2020) that being arrested might produce can exacerbate escaping the stigma, leading to a more a durable effect.

In addition, arrest can illicit strong uncertainty about the future where the arrested individual does not know how the arrest will impact their life. Sugie and Turney (2017) speculate that this uncertainty is a primary stressor that may be driving the relationship between arrest and impaired mental health. While testing this relationship directly is beyond the scope of this paper, it is still probably the case that arrest is exerting a durable impact on depression due in part to this primary stressor. However, I also found that the effects of arrest on depression dissipate by wave 7. This might suggest that arrest can exert a durable effect on a person's mental health beyond the initial arrest event, but that this effect could be reduced over time.

Finally, I find that certain conditions of confinement are significantly associated with depression at wave 6. Previous literature on conditions of confinement and mental health indicate that things such as overcrowding and security level are linked to increased levels of stress and decreased psychological well-being (Huey and McNulty 2005; Lawrence and Andrews, 2004; Innes, 1987; Cox et al. 1984). Edgemon and Clay-Warner (2019) tested various conditions of confinement and individual inmate mental health using nested data. They found that experiencing a punitive prison regime and being in an overcrowded prison were significantly associated with poor mental health net of individual factors. However, while this literature has linked conditions of confinement with poorer mental health outcomes, this is one of the first studies to assess how these conditions might impact the mental health of individuals after being released. My findings here suggest that these conditions of confinement do indeed exert some impact on depression after the person has been released. This expands current knowledge on how these conditions of confinement might extend beyond the prison or jail and can have detrimental effects on individuals even after they leave confinement.

Limitations, Future Considerations, and Conclusions

While the findings here contribute to and extend knowledge of how criminal justice contact impacts health over time, there are some notable limitations. First, while my analysis does separate distinct effects of the criminal justice process, it does not explain the underlying mechanism by which arrest, incarceration, and conditions of confinement may be impacting depression. Contemporary research has begun to explore this link and it seems to be the case that the collateral consequences of incarceration and arrest (financial strain, family conflict, stigma, discrimination, problems finding housing) might be relevant (Porter and Novisky, 2016; Schnittker et al., 2015). For example, Porter and Novisky (2016) demonstrated that the association between being incarcerated and later depressive symptomology was primarily explained through financial hardship. Binswanger et al. (2012) found that the lack of social support due to having been incarcerated resulted in feelings of isolation among formerly incarcerated individuals. This is a fruitful area of future research that should be considered.

Next, there are several limitations concerning the measures utilized in this study. While these limitations have been discussed previously, it is sufficient to say that the measures of criminal justice contact are quite brutish. The arrest measure does not give an indication of how long the person spent in police custody. Further, the type of offense that the person was arrested for is not clear. The primary weaknesses of the measure for incarceration is that it does not separate between prisons and jails and it does not give an indication of the amount of time spent in the incarcerated facility. All of this probably matters for the impact that arrest and incarceration have on individual depression.

One major area that future research on this topic might explore is how arrest, incarceration, and conditions of confinement impact physical health over time. Some research

has begun to consider the wider impact of arrest and other supervisory measures on physical health (Fernandes 2020). However, there is virtually no research that uses biomarker indicators of how something like arrest might lead to negative physical health effects like inflammation later in life. Further, literature on conditions of confinement has yet to specify how something like overcrowding might impact the rate of infectious diseases relative to other prison deprivations. Understanding the physical health effects of these various levels of criminal justice contact is crucial for fostering a greater understanding of how the criminal justice system affects health.

In conclusion, mental health is a serious problem among incarcerated populations and among people who come into contact with the criminal justice system in other ways. This evidences a need to conduct research aimed at uncovering the impacts that the criminal justice system has upon individual trajectories of health over time. Comparing the effects of incarceration with the effects of arrest is important as it would expand empirical literature on the exact process of how the criminal justice system impacts health. Further, there is still a need to examine how conditions of confinement might impact a person after release from prison or jail. Notwithstanding the limitations of this paper, my findings extend knowledge about the health effects of these various levels of criminal justice contact. I found that arrest has a durable impact on depression over time; however, this effect does seem to dissipate. While incarceration is not shown to have a durable impact of depression over time, certain conditions of confinement might continue to impact the person after release. Thus, it does seem to be the case that different levels of the criminal justice contact exert themselves upon individuals in different ways. Taken together, all of these findings evidence a greater need for future research that considers these levels of contact in different ways and on different health outcomes.

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CHAPTER 4

STRUCTURAL ANALYSIS OF INCARCERATION RATES AND POPULATION MENTAL HEALTH[3]

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ABSTRACT

The dramatic increase in the number of persons incarcerated in the United States in the last several decades has resulted in substantial costs to American society and, in many ways, prison has come to function as an engine of inequality. While the economic and labor costs of incarceration have received considerable attention at the structural level, there is still a relative scarcity of literature that assesses how mass incarceration has produced systematic impacts on the mental health of American society. In order to address this gap in the literature, I use data gathered from the Bureau of Justice Statistics and Centers for Disease Control to analyze how state-level incarceration rates from 1993 to 2000 are associated with state level-mental health rates during the same time period. Findings indicated that increases in state-level incarceration correspond with subsequent significant increases in aggregate state-level mental health problems. In all, these findings emphasize the macro-level role that prisons and mass incarceration play in shaping societal level outcomes of mental health. Implications of these foundation findings for future research are discussed.

INTRODUCTION

The dramatic increase in the number of persons incarcerated in the United States in the last several decades has resulted in substantial costs to American society and in many ways, incarceration has come to function as an engine of inequality (Wakefield and Uggen 2010). Thus, much like education, incarceration has a hand in shaping the stratification of American society. Much of the previous research on how mass incarceration contributes to inequality has noted how incarceration has generated considerable economic inequality in labor markers by incapacitating potential workers, making it impossible for persons to gain work experience, and by requiring former felons to identify their ex-convict status to potential employers, which decreases their chances of obtaining gainful employment (Western 2006; Pager 2009). Moreover, individual wage-earning potential suffers when individuals are incarcerated, with wage penalty estimates ranging from 10-30% (Petit and Western 2004; Wakefield and Uggen 2010). These economic impacts often transcend the individual who has been incarceration as they can impact the family unity as well through reduced ability to provide for the schooling and nutrition of children to placing the burden of family survival on one person (Turney, Wildeman, and Schnittker 2012). In addition, the concentrated economic disadvantage that incarceration can cause for individuals and families might adversely impact entire communities where previously incarcerated people tend to reside (Western 2006). This is particularly impactful for communities of color given the disproportionate rates of incarceration among Black men (Western 2006).

However, while the economic and labor costs of incarceration have received considerable attention at the structural level, there is still a relative scarcity of literature that assesses how mass incarceration has produced systematic impacts on the health of American society. Past research has indicated that incarceration is associated with poor mental and physical health

outcomes contributing to increased depression, mood disorders, anxiety, higher rates of infectious diseases, and higher rates of mortality (Porter and Novisky 2016; Massogilia 2008; Schnittker and John 2007). These health effects have also been demonstrated to last after the incarceration event once the person is released and thus incarceration can represent a durable health effect for individuals over time (Porter and Novisky 2016). As with the economic impacts of incarceration, there is reason to believe the health impacts of incarceration also transcend beyond the incarceration event and can impact the family unit as well. Past research has shown that parental incarceration adversely effects the health of the children in the household (Foster and Hagan 2013). It may also be the case that the spouse of the incarcerated individual has impaired health effects related to the incarceration of their romantic partner (Lee et al. 2014). Finally, parents of incarcerated individuals might also receive negative health effects as a result of the incarceration of their child (Goldman 2019). As with the economic impacts, these health effects of incarceration might also impact community-level health as the numbers of incarcerated individuals increase.

Having said this, with a few exceptions, the incarceration and health literature has yet to focus on the relationship between mass incarceration and population health. What little research exists on this topic is primarily about physical health and mortality (Light and Marshall 2018) and has does not focus on population-level mental health. To date, there does not exist a foundational report on how incarceration at the structural level might be associated with the mental health of the population. This is unfortunate because we still do not understand the macro-level impacts of mass incarceration as a system of inequality on population-level mental health. It is clear that these health effects transcend the individual who has been incarcerated, and this warrants more investigation into the incarceration-health link at the structural level. In

this paper, I provide a descriptive analysis of the associations between mass incarceration and population-level mental health in the United States over time. This analysis is one of the first to systematically investigate the associations between mass incarceration in the United States and population-level mental health. My intention with this analysis is to provide a foundation upon which future research on mass incarceration in the United States and population-level mental health can be built by reporting on the availability of mental health data at the population level and showing how these data might be related to mass incarceration.

BACKGROUND

The immense increase in the numbers of incarcerated people in the United States over the last several decades is well documented (Wakefield and Uggen 2010). As previously noted, prior to the 1970's, incarceration rates remained stable. In 1970, there were approximately 140,000 persons incarcerated in prison. By 2014, there were about 1.5 million people incarcerated in prisons (The Sentencing Project 2019). In particular, the 1990's represented a massive increase in the numbers of people sent to prison each year and, in many ways, created the prison population that is seen today (Western 2006). In their review of previous research on the societal impacts of mass incarceration, Wakefield and Uggen (2010) describe how incarceration has come to represent an engine of inequality. They detail how social scientific research has widely documented the influence of stratification on selection into prison. That is, certain inequalities such as racial inequality and educational inequality have been shown to increase the risk of incarceration (Western 2006). However, because mass incarceration has become such a permeating institution within American society, it has necessarily begun to produce these inequalities. In this vein, mass incarceration contributes in no small way to the generation of health inequalities. The following sections detail previous literature on the incarceration-health

link paying particular attention to how incarceration generates health inequalities that transcend individual experience.

Incarceration and Individual Health

As noted previously, the links between incarceration and mental health of the person who has been incarcerated have been established in previous literature, although the mechanism remains unclear. In terms of current incarceration and health, Sykes (1958) originally expressed how the "pains of imprisonment" can negatively impact persons who are incarcerated. These pains of imprisonment represent the depriving structural aspects of incarceration that transcend beyond the individual, and research conducted in the vein of Sykes's original formulation has been dubbed the deprivation model (Dye 2010). While deprivation research has primarily focused on how inmate violence might be attributed to prison deprivations (Dye 2010), there is a growing body of literature which utilizes the deprivation model to try and illuminate the health incarceration link. Thus, scholars have noted how prison conditions such as overcrowding and activity deprivation might contribute to the development of depression and suicide ideation among currently incarceration populations (Edgemon and Clay-Warner 2019; Huey and McNulty 2005). These pains of imprisonment also seem to increase stress, particularly among incarcerated mothers (Turney 2014).

Further, the impact of these pains of imprisonment on mental health seem to persist even when controlling for individual level experiences. For example, Liebling (2006) collected information from currently incarcerated persons which included information on individual experiences, prison setting, and inmate distress. Her analysis demonstrated that deprivation factors of the prison setting explained 45 percent of prisoner distress, while the pre-prison vulnerability measures explained between 8 and 15 percent of prisoner distress. In addition,

Edgemon and Clay-Warner (2019) utilized a sample of male inmates nested within several state prisons and found that prison deprivations such as the availability of work assignments and overcrowding were significantly associated with impaired mental health net of individual factors.

In addition to the scholarship on currently incarcerated persons, there is a growing body of work that analyzes how being incarcerated might impact mental health after release. For example, Schnittker, Massoglia, and Uggen (2012) offer a robust analysis of the effect of ever being incarcerated on different types of mental disorders. The authors found that previous incarceration contributes to long-lasting mood disorders such as major depressive disorder. Their findings demonstrate the durability of incarceration on impaired mental health and point to larger health effects for the population. Porter and Novisky (2016) found a positive relationship between being incarcerated and later depressive symptomology that was primarily mediated through the material hardship imposed by incarceration. In addition to mental health, several scholars have demonstrated that being incarcerated increases the risk of contracting an infectious disease and mortality (Binswanger et al. 2007; Binswanger et al. 2011; Calcaterra et al. 2012; Patterson 2013), and imprisonment has been linked with reduced health care coverage (Foster and Hagan 2007).

Incarceration and Family, Community, and Population Health

While much of the research investigating the health-incarceration link has been conducted at the individual-level, there is emerging evidence that incarceration impacts family, neighborhood, and population health (Massoglia and Pridemore 2015). Much of this research is conducted with physical health and mortality as the outcomes. For example, in an analysis of state-level from 1990-2003, Wildeman (2012) found that incarceration of the parent was a significant contributor to population infant mortality. Similarly, Light and Marshall (2018) used

an instrumental variable to estimate state level incarceration rates from 1978-2010 and demonstrated that infant mortality rates would have been 19% lower over the past three decades in the absence of mass incarceration. Johnson and Raphael (2009) found a significant impact of incarceration on the population-level AIDS infection rates for both women and men.

The role that parental incarceration plays in the health of children has been widely investigated. This is important as many incarcerated individuals are parents to young children (Petersilia 2000), and this can thus give a good indication about how the health impacts of incarceration might transcend the individual. For one, the incarceration of parents can separate families and even force children into foster care (Hagan and Dinovizter 1999). The disruption and instability of the family unit can increase stress and lead to behavioral problems of children (Hagan and Dinovizter 1999). It is even the case that children with incarcerated parents are five time more likely to be incarcerated as adults than children of never-incarcerated parents (Petersilia 2000). This increased likelihood of incarceration coupled with the already negative effects on the health of children might create generational health impacts (Foster and Hagan 2013). Taking into account the family roles that formally incarcerated people inhabit, Turney, Wildeman, and Schnittker (2012) demonstrate that current and recent incarceration is significantly associated with an increased risk for major depression among fathers. This in turn could result in greater risk of mental health problems for children. Finally, in a large-scale quantitative examination of stress process on parental incarceration, Turney (2014) found that incarceration of the parent exerts a significant effect on several childhood health outcomes, ranging from conduct and behavioral problems to delays in child development, demonstrating the importance of parental incarceration on the stress-proliferation process of their children.

Related to the health effects of incarceration on children of incarcerated parents, there is some research which suggests that incarceration has impacts on the parents of those who are incarcerated. Child incarceration can negatively impact parental health. Past research has shown that mothers of incarcerated children describe the experience of their child being incarcerated as nightmarish (Condry 2007), and the stress of a child's incarceration might further exacerbate existing physical health difficulties of mothers (Braman 2004). In a large-scale quantitative analysis, Goldman (2019) further demonstrates that a child's incarceration is significantly associated with decreased maternal health. Here then, the potential spillover effects of incarceration on health can severely limit the quality of life for mothers of incarcerated children.

Mass incarceration might also have an impact on population level health through its spillover effects on the availability and efficacy of health care in a given state. Given that they are often uninsured (Pager, Western, and Bonikowski 2009), formerly incarcerated persons often seek health care in the form of emergency room visits (Mallik-Kane 2005). This increased use of emergency rooms is perhaps not surprising given the health impacts that incarceration can produce as detailed above as well as the limited avenues of treatment for many formally incarcerated persons (Mallik-Kane 2005). Certainly, this increased use of emergency services by formally incarcerated persons might negatively impact the availability of such services in states with high amounts of formally incarcerated persons.

Indeed, Schnittker, Uggen, Shannon, and McElerath (2015) detail how mass incarceration has created a spillover effect that has serious detrimental impacts on the health care systems of certain states focusing specifically on the impacts to emergency health care services. Through their multi-level and aggregate-level analyses, the authors found that residents of states where there are large numbers of formerly incarcerated persons have significantly less access to

personalized care and report significantly greater levels of dissatisfaction in the care that they received. These impacts were still observed for individuals who were far removed from being personally impacted by incarceration, thus indicating a spillover effect. Further, the authors conducted state-level analysis which confirmed that a greater number of formerly incarcerated persons in a given state was significantly associated with emergency room use and in percentages of uninsured patients. This study provides a strong indication that state-level variation in the numbers of incarcerated persons is an important consideration when evaluating the population level health impacts of mass incarceration.

Current Study

There has been a considerable amount of research that expands knowledge of the incarceration-health link both at the individual- and community-levels. Taken together, this research helps elucidate how incarceration serves as an engine of inequality. However, while things such as infant mortality and rates of infectious diseases are considered a valid indicator of societal well-being (Reidpath and Allotey 2003), research on the macro-level links between mass incarceration and population health does leave important gaps in the literature regarding mental health. With few exceptions past research does not necessarily inform us about how mass incarceration has impacted population mental health from a structural perspective (Wakefield and Wildeman 2013). Considering that past literature has already demonstrated the significant individual- and community-level mental health consequences of incarceration, it follows that mass incarceration could be impacting mental health at the population level.

The previous work on macro-level links between incarceration and population infant mortality and infectious disease transmission demonstrates that it is possible to examine the macro-level links between population mental health and incarceration. Pushing beyond an

analysis of infant mortality is important for understanding how mass incarceration has functioned as an engine of mental health inequality. In this paper, I take the first steps in addressing these gaps in the incarnation-health literature. I offer a foundational analysis that considers how incarceration at the state-level is associated with population-level and individual-level mental health from the years 1993 to 2000. This descriptive analysis provides a framework that future research on mass incarceration and population-level mental health can pull from in order to establish more robust links between incarceration and mental health.

DATA AND METHODS

Data

This analysis pulls data from a variety of secondary sources in order to produce a comprehensive examination of the relationship between mass incarceration and population level mental health from 1993-2003. First, I obtain data on the aggregate incarceration numbers at the state level from the Bureau of Justice Statistics' *Prison Population Counts* database. This database allows me to generate estimates of the total number of people incarcerated in each U.S. state and the District of Columbia for the years 1993-2000.

Next, mental health data are drawn from the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a cross-sectional survey conducted by the Centers for Disease Control and Prevention (CDC) that individual U.S. state health departments conduct monthly with residents of the state by phone. After survey data are collected, the respondent data are forwarded to the CDC and aggregated for each state. According to the BRFSS webpage, more than 500,000 interviews were conducted in U.S. states in 2011 (CDC). Importantly for this study, the BRFSS contains questions asking about individual respondent mental health since 1993. The BRFSS also provides state level codes such that respondents can be nested within all 50 states and D.C. I also aggregated BRFSS mental health data at the state level. This aggregate

represents the average level of mental health for each state, which gives me the ability to assess how incarceration might be associated with state level mental health in any given year between 1993-2000. Sample sizes in the BRFSS vary between each year, and these variations will be noted in the results section.

Dependent Variables

The dependent variable for this analysis is self-reported mental health measured by a question from the BRFSS asking "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" This is a discrete measure where the respondent indicates a value of days ranging from 0-30. A response of 0 indicates no days of poor mental health in the last month while 30 indicates 30 days of poor mental health in the last month. Thus, higher numbers represent poorer mental health. I also aggregated this measure to represent state level mental health by averaging the total number of days indicated by each respondent in each state. Thus, the aggregate measure represents the average number of poor mental health days for each person in each state. As a measure of mental health, this question certainly does not assess the variability in mental disorders, nor does it function as an official diagnostic measure. However, this question does give some indication about mental health at the state level and is one of the only measures of state level mental health conducted with such a large sample of persons across each state.

Independent Variable

The independent variable for this analysis is state-level incarceration. This is measured by the number of persons who are incarcerated in each state for any given year between 1993 and 2000 adjusted for state population per 100,000 persons. Thus, this variable represents the

state incarceration rate per 100,000. These data were pulled from the BJS National Prisons Database and thus give a valid measure of state level incarceration for any given year. Since these numbers are by state, the incarcerated population of any given state can be matched to individual respondents in the BRFSS for any given year.

Analytical Strategy

Two separate analyses were constructed to estimate the associations between state-level incarceration on mental health both at the individual and state levels. The first analysis uses OLS regression that regress state-level mental health for the years 1993-2000 on state-level incarceration for the same years. As noted, state-level mental health is an aggregate measure of individual mental health for each of the 50 states and D.C. Here, the unit of analysis is the state. Thus, this model demonstrates association between rates of incarceration in the state and population-level mental health of that state on average. The second analysis is a supplementary analysis and offers a summary of how state-level incarceration is associated with the mental of individuals residing within the state. To estimate these individual associations, hierarchical liner models (HLM) were performed where individual respondents in the BRFSS are nested within 50 states and D.C for each year between 1993 and 2000. State-level incarceration is modeled as a level-2 indicator and allowed to predict individual-level depression for the years 1993 to 2000. Thus, the unit of analysis here is the individual respondent nested within a state. These HLM models are useful to supplement the original OLS models as they demonstrate any effects of state-level incarceration on individual-level mental health while controlling for the clustering of errors at the state level and are thus meant to supplement the descriptive findings of the OLS models in order to provide a better foundation for future research.

FINDINGS

Table 4.1 details the average mental health of each state for each year between 1993-2000. There is variation in the average numbers of poor mental health days within some states over time whereas others remain relatively consistent across time. For example, average for Michigan remain relatively stable across the 7 years whereas averages for Alabama vary across the same amount of time. Table 4.2 details the incarceration rate of each state for each year between 1993-2000. Again, the incarceration rate is based on the numbers of incarcerated people per 100,000 population.

Table 4.1. Average Poor Mental Health Days by State for Years 1993-2000

	1993	1994	1995	1996	1997	1998	1999	2000
AL	1.94	2.55	3.49	3.64	3.37	4.03	3.52	3.75
AK	2.75	2.92	2.88	3.25	3.09	2.69	3.23	3.01
AZ	2.88	3.26	2.90	2.34	1.4	1.00	1.12	2.78
AR	2.81	2.78	2.85	3.21	3.18	3.78	3.41	3.52
CA	3.58	3.77	3.10	3.09	3.47	3.17	3.33	3.38
CO	3.52	3.61	3.12	2.23	3.39	3.14	3.23	3.12
CT	2.30	1.59	3.01	3.11	2.83	2.99	2.86	3.15
DE	3.40	3.20	3.09	2.51	3.31	2.93	2.25	3.09
DC	1.34	1.45	1.65	3.04	2.13	2.13	2.85	3.54
FL	3.40	3.21	3.54	3.39	3.47	3.05	3.17	3.29
GA	2.80	3.22	2.78	2.29	2.72	3.51	3.35	3.52
HI	2.47	2.52	2.12	3.14	2.67	2.47	2.28	2.50
ID	3.23	3.14	3.19	3.17	3.29	3.07	3.27	3.60

IL	2.21	1.88	2.18	3.36	3.32	3.08	2.97	2.92
IN	3.18	3.51	3.71	3.38	3.81	3.38	3.51	3.52
IA	2.33	2.16	3.29	3.06	3.11	3.03	2.96	2.45
KS	2.50	2.26	3.12	2.22	1.88	2.86	2.46	2.98
KY	2.79	4.04	4.92	5.01	5.27	4.89	5.19	4.79
LA	2.78	2.98	3.20	3.32	3.58	3.07	3.49	3.18
ME	2.31	2.01	2.39	3.02	2.93	2.69	2.84	3.25
MD	2.63	2.27	2.28	2.41	1.91	3.52	3.75	3.24
MA	3.23	3.89	3.45	3.66	3.16	3.15	3.10	3.62
MI	3.40	3.60	3.49	3.46	3.41	3.83	3.63	3.70
MN	3.24	3.00	3.24	3.27	3.08	3.14	2.94	2.83
MS	3.22	2.95	2.82	2.44	2.56	3.47	3.54	3.64
MO	3.16	3.22	3.29	3.33	3.34	3.38	3.04	3.48
MT	3.18	2.54	2.73	2.65	2.77	2.82	2.90	2.27
NE	2.72	2.53	2.98	2.60	2.88	3.05	2.80	2.61
NV	4.01	4.24	3.67	3.56	3.65	3.61	3.77	3.37
NH	3.03	3.20	2.82	2.89	3.05	3.08	3.23	2.74
NJ	2.29	2.04	2.56	3.19	3.00	2.83	3.00	3.35
NM	2.36	3.15	3.21	3.74	3.47	3.52	3.88	3.57
NY	3.25	2.71	3.42	2.23	3.12	3.11	3.07	3.31
NC	2.50	1.90	2.11	2.14	2.59	2.67	3.05	3.04
ND	3.19	3.23	2.96	2.98	3.11	2.57	2.49	2.73
OH	2.94	3.06	2.58	1.93	2.12	2.85	2.45	3.49

OK	2.67	2.55	1.66	1.91	1.73	2.05	2.53	2.34
OR	3.11	3.13	3.49	3.33	3.38	3.69	3.88	3.78
PA	3.00	1.85	3.12	3.05	3.06	3.05	2.97	3.40
RI	3.40	2.30	3.75	3.44	2.92	3.31	2.94	3.64
SC	2.58	3.25	2.61	3.06	1.69	3.12	2.78	3.36
SD	1.96	2.90	2.19	1.74	2.75	2.46	2.88	2.66
TN	2.77	2.91	2.61	2.81	3.66	3.64	3.26	3.20
TX	3.16	2.78	3.52	3.34	3.02	3.58	3.54	3.77
UT	3.09	3.47	3.32	3.64	3.70	3.66	3.48	3.72
VA	2.93	3.12	3.15	3.07	3.23	3.54	3.42	3.58
VT	2.95	2.94	3.30	3.11	2.62	2.84	2.91	3.05
WA	2.97	3.37	3.19	2.73	2.62	3.20	3.26	3.33
WV	3.20	3.26	3.31	3.42	2.58	3.19	3.13	3.35
WI	3.10	3.15	2.92	2.51	2.92	2.47	2.98	4.40
WY	2.80	3.16	3.12	3.38	3.10	3.08	3.32	3.68
n	102,264	105,853	113,954	124,085	135,582	149,342	159,859	184,450

Table 4.2. Incarceration Rates per 100,000 by State for Years 1993-2000

	1993	1994	1995	1996	1997	1998	1999	2000
AL	442	451	478	492	500	519	549	549
AK	312	317	339	379	420	413	374	341
AZ	450	459	473	481	484	507	495	515

AR	432	450	471	357	392	415	443	458
CA	362	384	416	451	475	483	481	474
CO	285	289	292	322	342	357	383	403
CT	303	321	318	314	397	372	397	398
DE	326	393	413	428	443	429	493	513
DC	1432	1583	1650	1609	1,682	1913	1314	971
FL	398	406	447	439	437	447	456	462
GA	412	456	470	462	472	502	532	550
HI	198	202	217	249	288	307	320	302
ID	240	258	283	319	323	330	385	430
IL	305	310	317	327	342	357	368	371
IN	243	258	275	287	301	321	324	335
IA	184	192	207	222	243	258	252	276
KS	232	249	274	301	304	310	321	312
KY	264	288	311	331	372	379	385	373
LA	501	530	568	615	672	736	776	801
ME	112	118	111	112	124	125	133	129
MD	386	395	404	412	413	418	427	429
MA	164	171	175	302	278	275	266	152
MI	412	428	429	440	457	466	472	480
MN	97	100	105	110	113	117	125	128
MS	391	408	464	498	531	574	626	688
MO	321	338	358	409	442	457	477	494

MT	190	194	204	235	255	310	335	348
NE	139	159	185	194	200	215	217	228
NV	435	460	482	502	518	542	509	518
NH	164	177	174	177	184	182	187	185
NJ	301	310	340	343	351	382	384	362
NM	214	220	231	261	256	271	270	279
NY	358	367	378	383	386	397	400	383
NC	298	322	382	379	370	358	345	347
ND	70	78	85	101	112	128	137	158
OH	351	377	400	413	429	432	417	406
OK	472	508	552	591	617	622	662	685
OR	162	175	206	226	232	260	293	316
PA	201	235	268	286	291	303	305	307
RI	182	186	186	205	213	220	193	197
SC	482	494	515	532	536	550	543	532
SD	228	240	256	281	303	329	339	353
TN	262	277	287	292	309	325	408	399
TX	602	636	653	686	717	724	762	730
UT	143	155	173	194	205	205	245	254
VA	375	395	414	404	407	399	447	422
VT	135	168	143	137	140	188	198	218
WA	195	201	212	404	233	247	251	251
WV	101	106	136	224	174	192	196	211

WI	156	187	201	150	283	334	375	376
WY	233	254	291	230	326	327	355	349
N	51	51	51	51	51	51	51	51

Table 4.3 details the results of the OLS regression where state-level mental health is regressed on state-level incarceration. The unit of analysis in this model is the state. As is shown, results for this model suggest that there is a significant positive association between state-level mental health and state-level incarceration for any given year. In 1993, a one unit increase in the incarceration rate in the state corresponds to an increase of .0036 of reported aggregate poor mental days for the state ($\beta = .0036$; $p<.001$). Results for 1994 show a one unit increase in the incarceration rate in the state corresponds to an increase of .0065 of reported aggregate poor mental days for the state ($\beta = .0065$; $p<.001$), while 1995 in a unit increase in the incarceration rate in the state corresponds to an increase of .0012 of reported aggregate poor mental days for the state ($\beta = .0012$; $p<.001$). Next, results for 1996 detail that a one unit increase in the incarceration rate in the state corresponds to an increase of .0056 of reported aggregate poor mental days for the state ($\beta = .0056$; $p<.001$), and findings for 1997 show that a one unit increase in the incarceration rate in the state corresponds to an increase of .0013 of reported aggregate poor mental days for the state ($\beta = .0013$; $p<.001$). Finally, there are similar results for 1998 ($\beta = .0016$; $p<.001$), 1999 ($\beta = .0011$; $p<.001$), and 2000 ($\beta = .0028$; $p<.001$). Results for all years are significant at the .001 level. The r-squares for all of these models are quite small suggesting that the explained variance in state-level mental health by the models is low. This is probably due to the fact that I include only a single predictor in the models as these are intended as descriptive models.

Table 4.4 details results for the supplementary HLM analysis where state-level incarceration is allowed to predict individual mental health. Again, the intention of including this supplementary analysis is to provide a description of how the clustering of errors at the state-level might affect future studies of mass incarceration and population-level mental health. As noted, the unit of analysis for this model is the individual nested within a given state. The model is broken apart by year and results are presented for each year between 1993 and 2000. As is shown, results for the HLM models are somewhat mixed. State-level incarceration does have a significant association with individual mental health for the years 1993 ($\beta = .0052$; $p<.05$), 1996 ($\beta = .005$; $p<.05$), and 1999 ($\beta = .0051$; $p<.05$). For 1993, a one unit increase in the incarceration rate in the state is significantly associated with an .0052 increase in the average number of poor mental health days for individuals. For 1996, a one unit increase in the incarceration rate in the state is significantly associated with an .0067 increase in the average number of poor mental health days for individuals. Finally, for 1999, a one unit increase in the incarceration rate in the state is significantly associated with an .0051 increase in the average number of poor mental health days for individuals. State-level incarceration is not significantly associated with individual mental health for the years 1994, 95, 97, 98, or 2000.

Table 4.3. OLS Regression Results for State Aggregate Depression on Incarceration Rate

	1993	1994	1995	1996	1997	1998	1999	2000
State Level	.0036**	.0065**	.0012**	.0056**	.0013**	.0016**	.0011**	.0028**
Incarceration	(.002)	(.005)	(.003)	(.005)	(.002)	(.005)	(.003)	(.004)
R-square	.05	.008	.02	.02	.007	.006	.004	.02
N	51	51	51	51	51	51	51	51

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

Table 4.4 Supplementary HLM Results for Individual Depression on Incarceration Rate

	1993	1994	1995	1996	1997	1998	1999	2000
State Level Incarceration	.0052*	.0032	.0022	.0067*	.0013	.0011	.0051*	.0023
N	102,264	105,853	113,954	124,085	135,582	149,342	159,859	184,450

* p<.05; ** p<.01

DISCUSSION

Previous research on the incarceration-health link details how the health impacts of incarceration can transcend the individual who is incarcerated. Such research details how incarceration of parents can produce various behavioral and health problems in their children (Turney 2014). Incarceration can produce detrimental impacts on the health care systems of certain states and specifically on the impacts to emergency health care services. Thus, incarceration can have negative ramifications for the health of the family unit, the community, and the population (Massoglia and Pridemore 2015), which points to the potency of mass incarceration as an engine of inequality (Wakefield and Uggen 2010). However, past research has yet to consider how mass incarceration might impact population-level mental health. In this paper, I provide a descriptive analysis that shows the associations between incarceration rates and U.S. state-level mental health. I do this by using state-level mental health data pulled from the BRFSS combined with incarceration rate data from the National Prisons Database for the years 1993 to 2000. I ran two separate analyses—the first and primary examining the associations between state-level incarceration and aggregated mental health of each U.S. state, and a supplementary analysis looking at the association between state-level incarceration and the individual mental health of BRFSS respondents nested within states. The intent of these

descriptive findings is to provide a foundational framework and first look into how mass incarceration is related to changes in population-level mental health.

The OLS models show a positive significant association between state-level incarceration and state-level mental health. Here, an increase in the incarceration rate per 100,000 persons in the state is associated with a positive increase in the average number of poorer mental health days reported in each state. These associations are significant for all years between 1993-2000 pointing to a potential durable impact of mass incarceration on state-level mental health. Thus, it seems to be the case that higher state incarceration rates are significantly related to poorer population level-mental health.

These results might point to a potential spillover effect of incarceration on the mental health of the population. Again, it has been established that being incarcerated is a significant stressor and is linked with poorer mental health overall for the incarcerated individual both during the period of confinement and after release (Porter and Novisky 2016; Schnittker, Massoglia, and Uggen 2012). Further, these poor mental health effects can transcend the individual and spill over into the family and community (Western 2006). For example, it is the case that higher numbers of incarcerated populations have detrimental impacts on the health systems of states particularly surrounding the availability of emergency services (Schnittker et al. 2015). All of these health effects of incarceration might translate into real effects at the population level where mass incarceration becomes a driving force of mental health inequality. My results indicate this potential effect where mass incarceration is perhaps driving average levels of poorer mental health at the state level. Here, higher rates of incarcerated individuals and families of incarcerated persons might be taxing already strained mental health resources creating a blockage of mental health services in the population.

Next, the foundational findings here also point to a potential mediating impact of mass incarceration, economic inequality, and population-level mental health. As mentioned, previous research on how mass incarceration contributes to inequality has demonstrated that mass incarceration generates considerable economic inequality in labor markers. Incarceration carries with it an individual wage penalty estimated to range from 10-30% (Petit and Western 2004; Wakefield and Uggen 2010). The economic impacts of incarceration have been shown to transcend incarcerated individuals as they can impact the family unit through reduced ability to provide for the nutrition of children and placing the burden of family survival on one person (Turney, Wildeman, and Schnittker 2012). These more community-level collateral consequences of incarceration might be driving, in part, the significant associations between incarceration rates and state-level mental health. That is, the economic inequality generated by mass incarceration might itself be producing mental health inequality as people struggle to survive in the wake of mass incarceration. Future research would do well to consider this potential link between mass incarceration, economic inequality, and population-level mental health.

Altogether, the findings here offer a descriptive account of how mass incarceration is associated with state-level mental health. This complements and expand on the previous micro-level literature that analyzes how incarceration impacts individual mental health (Porter and Novisky 2016) and the literature on how mass incarceration impacts the community (Turney 2014). The results from this analysis could help inform future health research on incarceration by emphasizing the macro-level role that prisons play in shaping societal-level outcomes of health above and beyond physical health and mortality outcomes.

Limitations, Future Considerations, and Conclusions

There are some notable limitations of this analysis. For one, the measure of mental health used as the dependent variable is a single self-reported item measuring poor mental health in a number of days throughout the last month. This is not a particularly rigorous self-reported measure and is certainly not a diagnostic measure. Certainly, a self-reported measure such as the CES-D would be preferred and would increase the validity of the study; however, while the measure of mental health used in this study is not ideal, this still represents on of the only measures of mental health at the state level over a considerable amount of time.

Next, this analysis is descriptive and is intended to provide a foundation upon which future research on the incarceration-mental health link can be built. Here, I have provided a report on the availability of population-level mental health data and have shown how these data are associated with incarceration rates of states over a number of years. While the associations presented are positive and significant, it is certainly the case that other state-level variables such as racial composition, poverty levels, and the numbers of female headed households would all exert some impact on state-level health (Light and Marshall 2018). Future research would do well to include these and other relevant independent indicators in order to offer a better approximation of the impacts of mass incarceration on population-level mental health. Relatedly, future research should also consider how mass incarceration predicts population-level mental health across time.

As already noted, future research should also consider how collateral consequences of mass incarceration might influence the associations between mass incarceration and population level mental health. Past research on mass incarceration has highlighted the economic consequences of mass incarceration such that it creates problems for persons to gain work

experience during the period of incarceration and forces former felons to identify their ex-convict status to potential employers. All of this decreases chances of obtaining gainful employment after release and also has negative impacts on the economic standing of the family unit (Western 2006; Pager 2009). The economic impacts of mass incarceration on individuals and on communities might mediate the impact that mass incarceration has on mental health such that the mechanism through which mass incarceration creates negative population level mental health impacts might be through its impacts on the economic standing of families and communities. Thus, future research should specify how these collateral consequences are related to the impacts that mass incarceration has on population-level mental health.

Despite the limitations of this study, this is still one of the first large scale analyses of how mass incarceration is associated with population-level mental health and lays the foundations for a more large scale and systematic study of mass incarceration and population-level mental health. Here, I provide a report on the availability and quality of mental health data at the population level, and I also show that state level incarceration is significantly associated with increases in the average amount of poor mental health days reported at the state level. These results not only help elucidate the incarceration-health link at the structural level, but also demonstrate another avenue of how mass incarceration might be functioning as an engine of inequality (Wakefield and Uggen 2010). This evidences a greater need to consider how mass incarceration over time has created crises in population level mental health.

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CHAPTER 5

CONCLUSIONS

In their review of literature on incarceration and health, Massoglia and Pridemore (2015) conclude that research in the area of health and incarceration is still in its infancy stages. They claim that research in this area will only continue to increase in importance as the population of persons released from prison increases. I agree that further research is required to elucidate the relationship between incarceration and health and to examine how incarceration functions as an engine of health inequality (Wakefield and Uggen 2010).

First, previous research on the pains of imprisonment (Skyes 1958) has demonstrated that various prison deprivations are associated with impaired mental health of currently incarcerated populations (Libeling 1992). However, there is still a greater need for this research to control for individual experiences in order to analyze how prison deprivations impact the mental health of incarcerated persons (Dye 2010). It is also the case that there is very little research that has considered how these prison deprivations might impact persons after they are released. Next, scholars have argued that solely focusing on incarceration is detrimental towards understanding the full impact of the criminal justice system on mental health and that research needs to go beyond incarceration to consider the impact of other forms of criminal justice contact (Sugie and Turney 2017). Finally, previous research has demonstrated certain spillover effects of mass incarceration on community health that transcend the incarcerated individual. Thus, incarceration can negatively impact individual- and community-level health (Massoglia and Pridemore 2015). In addition, mass incarceration as a system has been shown to have negative

impacts on health care systems at the state level (Schnittker et al. 2015) To date however, there has been virtually no research that considers how mass incarceration might impact population level mental health.

In this dissertation, I have addressed these various gaps in the literature through three distinct yet related manuscripts. The first manuscript offers an analysis of how the pains of imprisonment impact an understudied population—women in prison. Here, I combined individual-level data on female inmates available through the SISCF with institutional-level prison data available through the CCF in order to document the association between institutional-level factors and depression and hostility among currently incarcerated women. Doing so allowed me to nest individual women within prisons and perform a multilevel analysis. I primarily focused on deprivation of the prison environment surrounding visits with children and punitiveness, since literature suggests that these are significant issues in women's prisons (Kruttschnitt and Gartner 2003). Multilevel models controlled for predisposing individual-level factors that could confound the relationship between prison characteristics and mental health, as well as several prison-level factors that have been found to be associated with mental health of male inmates (Dye 2010).

The central finding of this manuscript was that increased averages of the lack of child visitation at the prison-level was significantly associated with individual depression even when controlling for individual variation in received visitation. This finding shows that prison deprivations might exert negative consequences for incarcerated women. This manuscript expands current literature on how the pains of imprisonment might be associated with the impaired mental health of inmates by focusing on incarcerated women and by controlling for

individual-level factors. Doing so gives a more precise view of how prison-level factors might be influencing the mental health of incarcerated populations.

My second manuscript answers calls from scholars to extend current research on the health-incarceration link beyond just incarceration to consider the impact other supervisory measures have on health (Sugie and Turney 2017). To expand understanding of criminal justice contact and mental health, I analyzed how both incarceration and arrest might impact the depression of individuals. I also considered the durability of these contact events by analyzing how arrest and incarceration impact depression later in the life course by using panel data collected in three separate waves. My findings indicated that both arrest and incarceration have a significant association with increased depression. However, the effect of incarceration dissipates in later waves and thus does not exert a significant impact on depression over time. The findings for arrest were different in that arrest did have a significant impact on depression over time, suggesting that the arrest event has a durable impact on mental health.

In addition, I also analyzed how various prison conditions impact mental health after release. I found that certain conditions of confinement do exert a significant and negative impact on an individual's mental health after they have been released. Thus, this manuscript makes two primary contribution to the literature. First, by separating arrest and incarceration, I expand understanding about how criminal justice contact impacts mental health. Next, I extend research on conditions of confinement and mental health by considering how these conditions impact a person's mental health after being released. This is important as much of the past research on how conditions of confinement might impact mental health are conducted with currently incarceration populations (Edgemon and Clay-Warner 2019).

My third manuscript offers a more structural level analysis of how mass incarceration impacts population level mental health. impacts family, neighborhood, and population health (Massoglia and Pridemore 2015). I found significant associations between state-level incarceration and state-level mental health for the years 1993-2000. These findings suggest a spillover effect of incarceration on population mental health not unlike incarceration spillover effects already detailed in the literature (Schnittker et al 2015). Altogether, this paper offers one of the first macro level analysis of how mass incarceration impacts population mental health, answers calls by scholars for more structural analysis as to the impacts of mass incarceration on American society (Massoglia and Pridemore 2015), and further expands literature of the health-incarceration link.

Taken together, the manuscripts that form the basis of my dissertation demonstrate the association between the pains of imprisonment and mental health outcomes for female inmates net of individual factors, expand knowledge about how criminal justice contact beyond incarceration impacts mental health, present one of the first studies on how the pains of imprisonment impact people after release, and offer a structural analysis of the relationships between mass incarceration on population mental health across time. Thus, my dissertation answers the calls made by scholars such as Massoglia and Pridemore (2015) by offering both an individual and structural level analysis on the links between incarceration and mental health. It is my goal to present these manuscripts for peer-review, and to thus have them published for a wider audience. Once published, these papers will fill important gaps in the health-incarceration literature and inform avenues of new research.

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