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Trauma Exposures Across the Life Course for Individuals Who Experience Incarceration

Maria Morrison
Washington University in St. Louis, m.morrison@wustl.edu

WASHINGTON UNIVERSITY IN ST. LOUIS

The Brown School

Dissertation Examination Committee:
Brett Drake, Chair
Darrell Hudson
Melissa Jonson-Reid
Carrie Pettus-Davis
Geoff Ward

Trauma Exposures Across the Life Course for Individuals Who Experience Incarceration

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Maria Morrison

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For Luca

Abstract

The U.S. incarcerates more people than any other country in the world, with 2.2 million people currently behind bars, 60% of whom are people of color. At the same time, there is an unprecedented political consensus to develop strategies for reducing the incarcerated population and safely returning the majority of incarcerated individuals to society. While there has been a substantial research focus on the potential of this population to commit acts of violence post-release, this tells only half the story. This dissertation hopes to provide a more complete picture of the role of violence in the lives of individuals released from prison – not only as perpetrators of violence, but also as victims of violence throughout their lives. Research indicates that this population experiences unusually high levels of exposure to trauma across the life course and that effective post-release intervention will require trauma-informed service systems and trauma-specific interventions. Lifetime prevalence of PTSD is estimated to be 20-60% for incarcerated men, compared to 3.6% in community samples. Few studies exist, however, documenting the types of trauma exposures and the developmental timing of the trauma exposures experienced by incarcerated individuals, especially men, as most trauma research to date has focused on incarcerated women. In order to develop appropriate interventions that increase the likelihood that incarcerated individuals will be capable of functioning in society after release, it is essential that knowledge about the specific nature of trauma for this population be further developed.

Data for this dissertation was taken from a parent study performing a randomized controlled trial (RCT) on a reentry intervention. The study sample consisted of 1544 individuals (90% male, 10% female) transitioning out of prisons in four states. Using latent class analysis, this dissertation identified three distinct classes or subgroups, each comprising about a third of the sample, based on type and timing of trauma exposures. While one class was defined by low

levels of exposures over the life course, the other two were characterized by high levels of either interpersonal polyvictimization or environmental exposures. Covariates such as gender, race/ethnicity, and mental health diagnosis were used to determine likelihood of membership within each subgroup based on individual characteristics. Additionally, relationships between class membership and adverse reentry outcomes were analyzed. Findings indicated that those with low exposures in childhood continued to have low exposures in adulthood and into the reentry period. Those with high trauma exposures in childhood continued to have high exposures in adulthood and into the reentry period. This is consistent with other trauma research, in particular polyvictimization research, which has found that trauma exposure acts as a risk factor for later trauma exposure. Moreover, each of the two high exposure classes was associated with risk for a different adverse reentry outcome, supporting a tailored approach to intervention design.

This dissertation concludes by proposing an original conceptual framework, the Mass Incarceration Trauma (MIT) framework. The MIT framework is guided by an ecological systems perspective, a foundational theoretical approach in social work and public health, and recognizes that effective assessment and intervention requires an understanding of the complex contexts in which individuals live. The MIT framework presents the cumulative trauma exposures commonly faced by this population, before, during, and after incarceration, at the individual, social, environmental, and historical levels. Because traumatic stress undermines health and daily functioning, it is essential that interventions for this population address both the ongoing risk for trauma exposure and the consequences of multiple, repeated past exposures across ecological levels. It is hoped that the findings from this study will contribute to a necessary knowledge base

aimed at advancing effective interventions and reducing trauma in the lives of incarcerated individuals and the communities they return to.

Chapter 1: Introduction

The U.S. incarcerates more people than any other country in the world, with 2.2 million people currently behind bars, 60% of whom are people of color (Bureau of Prisons, 2020; Carson, 2020; Jeremy Travis et al., 2014). At the same time, there is an unprecedented political consensus to develop strategies for reducing the incarcerated population and safely returning the majority of incarcerated individuals to society (Petersilia & Cullen, 2014). While there has been a substantial research focus on the potential of this population to commit acts of violence post-release, this tells only half the story (Cullen, 2017). This dissertation hopes to provide a more complete picture of the role of violence in the lives of individuals released from prison – not only as perpetrators of violence, but also as victims of violence throughout their lives. Research indicates that this population experiences unusually high levels of exposure to trauma across the life course and that effective post-release intervention will require trauma-informed service systems and trauma-specific interventions (Miller & Najavits, 2012; Carrie Pettus-Davis, 2014). Lifetime prevalence of PTSD is estimated to be 20-60% for incarcerated men (Gibson et al., 1999; Trestman et al., 2007; Wolff et al., 2014) compared to 3.6% in community samples (Harvard Medical School, 2007). Few studies exist, however, documenting the types of trauma exposures, developmental timing of the trauma exposures, and types of trauma symptoms experienced by incarcerated individuals, especially men, as most trauma research to date has focused on incarcerated women (Miller & Najavits, 2012).

In order to develop appropriate interventions that increase the likelihood that incarcerated individuals will be capable of functioning in society after release, it is essential that knowledge about the specific nature of trauma for this population be further developed. Data for this dissertation was taken from a parent study performing a randomized controlled trial (RCT) on a

reentry intervention. The study sample consists of 1544 individuals (90% male, 10% female) transitioning out of prisons in four states. The parent study includes survey data about the participants' lifetime trauma experiences and current trauma symptoms, as well as a wealth of other demographic and background information. This dissertation used this data to document the numbers, types, and timing of trauma exposures for this sample. It is hoped that the findings from this study will contribute to a necessary knowledge base aimed at advancing effective interventions and reducing trauma in the lives of incarcerated individuals and the communities they return to.

1.1 Specific Aims

The high rate of mental illness in incarcerated populations is a major challenge in decarceration, with research suggesting incarceration itself may be a risk factor for mental illness (Dye, 2010). Increasingly, it is also understood that this is a highly traumatized population and that effective mental health intervention requires trauma-informed service systems (Miller & Najavits, 2012; Wolff et al., 2014). Studies from the past 15 years have found that incarcerated individuals have higher rates of both trauma exposure and trauma symptoms than the general population (Trestman et al., 2007; Wolff et al., 2011, 2014). In order to develop appropriate interventions that increase the likelihood that incarcerated individuals will be capable of functioning in society after release, it is essential that knowledge about the specific nature of trauma for this population be further developed.

Data for the current study was taken from an RCT titled the "Multisite Randomized Controlled Trial of the 5-Key Model for Reentry," being conducted by my dissertation committee member, Dr. Carrie Pettus-Davis, at the Institute for Justice Research and Development (IJRD) of Florida State University's College of Social Work. Funded for 8 years

and $7.5 million by the Koch Foundation, the parent study includes survey data about the participants' lifetime trauma experiences and current trauma symptoms. This dissertation, guided by the polyvictimization literature (Finkelhor et al., 2007) used this data to document the numbers, types, and timing (before, during, or after incarceration) of trauma exposures for this population. It also examined how trauma varies across types of incarcerated individuals, such as whether trauma experiences differed by race/ethnicity and socioeconomic variables. The dissertation had the following specific aims:

Aim 1: Identify distinct classes or latent subgroups of study participants based on lifetime trauma exposure using latent class analysis (LCA). It was hypothesized that there would be subgroups distinguished by number, type (e.g., childhood maltreatment, community violence exposure), and timing (i.e., before, during, or after incarceration) of trauma exposures.

Aim 2: Determine membership within latent classes according to demographic, socioeconomic, and mental health variables (Lanza & Rhoades, 2013). Using a structural equation modeling (SEM) framework, demographic and criminal justice covariates were incorporated as predictors of latent class membership to determine if certain characteristics of individuals increase the likelihood of belonging to certain subgroups. It was hypothesized that gender, race/ethnicity, and mental health will be predictive of class membership.

Aim 3: Analyze the relationships between latent class membership and reentry outcomes (Lanza et al., 2013). Using LCA with distal outcomes following the Bolck-Croon-Hagenaars (BCH) approach (Bolck et al., 2004) latent classes were used as independent variables to predict dependent variables, such as having an income, securing housing, and re-involvement in the criminal justice system. It was hypothesized that membership in classes characterized by more severe, chronic trauma exposure would increase the probability of poor post-release outcomes,

including re-arrest. Meeting diagnostic criteria for PTSD (based on the PTSD MINI) (Lecrubier et al., 1997) would be explored as a possible mediating variable in this stage of the analysis.

1.2 Research Questions and Hypotheses

Service systems have paid little to no attention to the trauma and consequences of trauma in the lives of individuals, particularly men, who experience incarceration. This is despite evidence that trauma is highly prevalent and severe for this population and undermines individuals ability to return to and function within society. A research foundation on the nature of trauma for this population is still needed in order to increase the numbers of services as well as the effectiveness of those services. This study used a large, longitudinal data set to answer as yet unanswered questions about the kinds of trauma experienced by this population across the life course. It aims to offer a more complete picture of a poorly understood and highly stigmatized segment of society.

Research Question 1

Are there distinct subgroups among individuals who experience incarceration, based on lifetime trauma exposure?

Hypothesis 1

While it is understood that this is a highly traumatized population generally, it was hypothesized that individuals who experience incarceration are heterogeneous in their trauma experiences.

Research Question 2

Do individual characteristics predict membership in these trauma subgroups?

Hypothesis Set 2

It was hypothesized that gender, race/ethnicity, and mental health would be predictive of subgroup membership.

Research Question 3

Does subgroup membership predict reentry outcomes?

Hypothesis Set 3

It was hypothesized that membership in subgroups characterized by more severe, chronic trauma exposure would increase the probability of poor post-release outcomes, including re-arrest, lack of income, and insecure housing.

1.3 Significance

Mass incarceration is one of the most urgent social issues of the 21st century. The U.S. has a higher rate of incarceration than any other country in the world, with 5% of the world's population but nearly 25% of the world's prisoners (Jeremy Travis et al., 2014). With exponential prison population growth in the past 40 years, there are now 2.2 million people in jails and prisons and an additional 4.4 million (Bureau of Prisons, 2020; Carson, 2020; Laura M. Maruschak and Todd D. Minton, 2020) on probation or parole (Bureau of Prisons, 2020; Carson, 2020; Maruschak & Minton, 2020). The U.S. criminal justice system has disproportionate contact with people of color and people of low socioeconomic status (Cloud, 2014; Jeremy Travis et al., 2014; Wolff et al., 2015). African Americans, for example, are 5 times more likely to be incarcerated than Whites, and Hispanics are 2 times more likely than Whites (Carson, 2020). Jails and prisons have also become, by default, the largest providers of mental health services in the country, with prevalence of mental illness estimated to be 3-12 times higher than in the general population (James & Glaze, 2005; Sarteschi, 2013). Moreover, the majority of

prisoners have problems with alcohol or drug use and over half have experienced physical, sexual, or emotional abuse in childhood (James & Glaze, 2005; Wolff et al., 2014).

Mass incarceration is an issue of public health, public safety, and racial and economic justice (Cloud, 2014). It implicates multiple service systems including not only the many facets of the criminal justice system (i.e., policing, courts, corrections) but also systems that treat substance abuse and mental health (when jails are the largest mental health providers in the country) and child welfare systems (when 1 in 14 children experience parental incarceration) (Morrison & Drake, 2021; Turney & Goodsell, 2018) There is need for social work intervention and innovation in each of these systems to both respond to the consequences of mass incarceration and to bring about the end of mass incarceration (Krueger, 2019; Carrie Pettus-Davis, 2012).

Among the conditions created by mass incarceration are increasingly stressful and toxic prison environments. Prison facilities have been unable to keep up with the sustained growth in prison populations (Busansky & Bowman, 2011). With more individuals in prison, facilities lack the resources to provide adequate substance use treatment and mental health care (Cloud, 2014). The housing conditions in prisons are typically cramped and unsanitary with poor ventilation which, combined with inadequate medical protocols, lead to spread of disease (Cloud, 2014). Individuals in prison have chronic and contagious diseases at rates 1.5 - 2 times higher than the general population (Maruschak et al., 2015). With more individuals in prisons, there are also fewer education, work, and treatment programs available within these facilities, leading to increased idleness, less opportunity for treatment, and a "warehousing" effect on the prison population (Berthelot, 2013).

As a result of these strains on correctional systems, prisons have become sites of trauma. Violence is prevalent in prisons. Prisoner-on-prisoner physical victimization is estimated to be as high as 10 times the rate of physical victimization in community samples (Wolff et al., 2007). Moreover, persons with mental illness are estimated to be victimized at a rate 11 times that of the general population and are particularly vulnerable in prison settings (Blitz et al., 2008). For men with a diagnosed mental illness, rates of violent victimization in prison are close to 50% compared to 35% for those without (Blitz et al., 2008). A large percentage of incarcerated individuals entered facilities with prior lifetimes of trauma exposures and related symptoms which can be made worse by the prison environment (Sadeh & McNiel, 2015). Moreover, incarcerated individuals experience traumatic stressors during their incarceration that threaten their physical and mental health (Miller & Najavits, 2012). For those who develop PTSD and other mental health symptoms, preliminary evidence indicates that following release from prison their risk for recidivism may rise (Sadeh & McNiel, 2015).

Nearly all (95%) of people in prison will eventually be released (James, 2014). Approximately 700,000 prisoners are released per year (James, 2014). According to a Bureau of Justice Statistics (BJS) study, 77% of people released from prison were re-arrested within 5 years (Alper et al., 2018). The process of returning to society from prison, a process commonly referred to as "reentry," is a fraught experience during which the majority of former prisoners have limited financial and social resources and face barriers to employment, housing, and basic medical and mental health care (Alper et al., 2018; James, 2014). Successful reentry is threatened by poverty, substance use relapse, unmanaged chronic disease and mental health disorders, and family strain (James, 2014). Mental health symptoms related to traumatic stress or PTSD create significant disadvantages and functional impairments for former prisoners,

adding to the already significant challenges of reentering society (Sadeh & McNiel, 2015). Of particular concern for chronically or repeatedly traumatized individuals is difficulties with emotion regulation, dissociation, and interpersonal instability which have been associated with behavioral health problems including substance use and criminal involvement (Van Der Kolk et al., 2005).

In recent years there has been a growing awareness of the presence and consequences of traumatic stress for incarcerated people. Nearly all incarcerated adults (more than 85%) report a history of violence and trauma exposure (Wolff & Shi, 2012). Studies indicate that the rate of post-traumatic stress disorder (PTSD) may be 4 to 10 times higher among the incarcerated than community samples (Wolff & Shi, 2012)**.** The majority of studies have focused on the trauma experiences of incarcerated women who are often victims of sexual and intimate partner violence (Miller & Najavits, 2012). Initial studies of incarcerated men have revealed that trauma is common and that gender-specific interventions should target men as well (Wolff et al., 2012). Little is known, at this time, about the specific nature of the trauma of incarcerated men and even less is known about effective intervention approaches which could be used to work with this trauma (Wolff et al., 2012). This study seeks to contribute to a research foundation on the trauma of individuals who experience incarceration with the long-term goal of improving services to this population and reducing mass incarceration.

1.4 Conclusion

This study allows for the identification of subgroups as well as the relationships between subgroup membership and reentry outcomes. This knowledge base will be used to advance theory regarding prevention and treatment needs for individuals who experience incarceration. It will also be used to inform the adaptation of trauma-specific and trauma-informed interventions

and policy approaches for this population. Understanding trauma risk subgroups and their relationships to reentry outcomes will enable development and targeting of interventions for populations experiencing incarceration, with the aim of improving mental health and reducing re-incarceration rates.

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Chapter 2: Trauma and Incarceration: A Latent Class Analysis of Lifetime Trauma Exposures for Individuals in Prison

Abstract

This paper aims to contribute to the knowledge base about the lives of individuals who experience incarceration in the U.S. in order to advance post-release intervention services. Research has shown that among the millions of Americans who cycle through prisons and jails each year, the majority are poor, in poor health, living in contexts of chronic violence, often with mental illness, and more than half are people of color. Of particular concern for this population are high rates of trauma exposure and PTSD, though the research in this area is underdeveloped, particularly for men. Using survey data gathered during a large (n=1,516, 90% male) multi-state randomized control trial of a reentry intervention, this study used latent class analysis (LCA) explore the types and timing of trauma exposures across the life course. LCA has been found to be an effective statistical tool in intervention research for identifying high risk groups and for informing the tailoring of interventions. This study found three latent classes, *Lifetime Interpersonal Polyvictimization, Lifetime Environmental Exposures,* and *Low Exposure.* About one third of the sample fell within each class. Study findings indicate that not only should trauma-informed and trauma-specific interventions be the norm in reentry services, including for men, but that these interventions should target both individual and environmental factors.

2.1 Introduction

This study aims to contribute to knowledge about the mental health needs of incarcerated individuals. We begin by providing an overview of what is currently known about the mental health challenges for this population. This overview includes what is known about the trauma histories and related mental health outcomes for individuals in U.S. prisons. It also includes a review of current research on polyvictimization, an area of trauma research of particular relevance to this population. This section concludes with a brief introduction to the statistical approach used in this study, Latent Class Analysis (LCA), and its usefulness in intervention research generally.

Mental Health Needs for Incarcerated Populations

Incarcerated populations have high rates of mental and behavioral health problems. Mental illness in correctional facilities is estimated to be 3-12 times higher than in the general population (James & Glaze, 2005; Sarteschi, 2013). Fifty percent of people in prison have a substance use disorder (SUD), compared to 9% of the general population (Karberg & James, 2005; Fazel, Bains, & Doll, 2006; Grant, et al., 2004). Correctional systems are not equipped to respond to this level of treatment need, with chronic shortages of mental health providers (Cloud, 2014). For example, it is estimated that only about 15% of those in need of substance abuse treatment receive it (Wagner & Walsh, 2016). Not only are those entering prisons unable to access adequate medical and mental health care, there is reason to believe that conditions of confinement in U.S. prisons lead to increased health service need. Violence and injuries are among the most common health problems reported within correctional facilities, with estimates ranging from 4-20% of individuals in state prisons reporting sexual victimization while

incarcerated and 10-35% percent reporting physical victimization (Wolff, et al, 2006; Wolff, et al., 2007).

Crowding is a defining characteristic of most correctional facilities and creates highly stressful living conditions (Travis, Western & Redburn, 2014). Correctional facilities functioning at or above capacity have not only crowded living spaces, with prisoners living in open dormitories in double and sometimes triple bunks, but also longer waits for access to treatment programs and increased use of solitary confinement as a means for managing disciplinary issues (Baggio et al., 2019; MacDonald, 2018). It is estimated that on any given day there are at least 84,000 people in US in solitary "with minimal access to natural sunlight, long periods of silence but also at times continuous noise from things like clattering metal doors and loud, startling outbursts and distressed voice" (Cloud, 2014, p. 13). Individuals can be held in these conditions for years and released directly to society. The psychological harm caused by solitary has been documented extensively over the past century (Haney, 2018).

In studies of incarcerated adults, the majority report a history of exposure to violence and trauma not only in prison but often beginning in childhood (Wolff & Shi, 2012). Studies indicate that the rate of post-traumatic stress disorder (PTSD) is 4 to 10 times higher among the incarcerated than community samples (Wolff & Shi, 2012)**.** The majority of trauma studies with incarcerated populations have focused on the trauma experiences of incarcerated women who are often victims of sexual and intimate partner violence(N. A. Miller & Najavits, 2012; M Morrison et al., 2019; Carrie Pettus-Davis, 2012). Initial studies of incarcerated men, who make up 90% of the prison population, have revealed that trauma is common and that gender-specific interventions should target men as well (Wolff et al., 2012). Little is known at this time, however, about the specific nature of the trauma of incarcerated men and how it might be

different from women. Even less is known about effective intervention approaches which could be used for a largely male population (Wolff et al., 2014). While it appears evident that trauma interventions for this population should be gender specific, given the differences in types and rates of trauma exposure by sex, further tailoring may be called for based on other factors within the male population.

Trauma exposure is associated with poor mental health outcomes, including PTSD and substance use disorders (Baranyi et al., 2018; Burns et al., 2016; Facer-Irwin et al., 2019). Research has also shown that there is a dose-response relationship between cumulative trauma exposures and increased risk for poor mental health outcomes (Edwards et al., 2003; Humphreys et al., 2020; Shevlin et al., 2008). In a study of individuals in prison (Greene, 2014) researchers found that physical and sexual abuse in childhood was associated with increased numbers of psychiatric disorders in adulthood. They also found that increased numbers of childhood trauma types (for example, experiencing both physical and sexual abuse, also known as polyvictimization) were associated with increased numbers of psychiatric disorders in adulthood other than PTSD (Finkelhor et al., 2007). For each additional type of childhood trauma, the study found a near 40% increase in the number of psychiatric diagnoses. The study also found that these associations disappeared when post-traumatic stress symptom severity was controlled for. Greene (2014) notes that this mediating effect is consistent with other research that has found PTSD to be a potential pathway to other psychiatric conditions. The researchers note that their findings support an intervention approach for mentally ill incarcerated individuals that includes treatment for traumatic stress.

Studies of incarcerated adults have also found that childhood trauma is associated with increased risk for psychiatric disorders in adulthood regardless of gender (Green, 2014; Gunter,

2012). Gunter (2012) found that in logistic regression models including both gender and trauma exposure, only trauma exposure was predictive of psychiatric disorder. These findings indicated that while the women were more likely to report traumatic experiences, they were no more likely than men to experience psychiatric disorders as a result of trauma.

It is important to note, also, that in prison settings, both a history of trauma exposure and having a mental illness are associated with higher risk for subsequent physical and sexual victimization (Caravaca Sanchez, 2017). In other words, trauma exposure in childhood is associated with increased risk for mental illness in adulthood which, in turn, is associated with increased risk for further trauma exposure in prison. For example, compared to those without mental illness, those with mental illness were physically victimized at twice the rate (40% vs. 20%) (Caravaca Sanchez, 2017).

Polyvictimization and Incarceration

Research in the area of polyvictimization has found that when individuals experience more than one type of trauma exposure (sexual as well as physical abuse, for example) they experience more severe mental health outcomes than those experiencing one type, even if that single type is repeated over time (Finkelhor et al., 2007). It has also found individual, social, and environmental risk factors associated with polyvictimization (Finkelhor et al., 2007; Layne et al., 2010; Lussier et al., 2018; Ramsey-Klawsnik, 2017). While the polyvictimization literature has developed primarily through research on children and the elderly, incarcerated populations share a key risk factor with both of these populations: Their lives are defined by a state of dependency in which they have little opportunity to escape their immediate circumstances (Finkelhor et al., 2009; Herman, 1992; Teaster, 2017). When those circumstances are innately dangerous, polyvictimization becomes likely (Finkelhor et al., 2007). Individuals in these circumstances –

whether a child in a dangerous family, an elder in an under-resourced nursing home, or an inmate in a state prison – face increased risk for multiple, "cascading" victimizations such that victimization becomes more of a "condition" than an event (Finkelhor et al., 2011; Ramsey-Klawsnik, 2017). Assessing for types of exposures as well as for high-risk contexts, then, may be an important consideration when researching incarcerated individuals and in considering intervention approaches.

Sociodemographic features may be associated with different patterns of trauma exposure within incarcerated populations. That is, while it appears from current research that individuals who go to prison universally have high rates of trauma exposure, the incarcerated population may not be homogenous in types of trauma exposures and, therefore, not homogenous in types of mental health service need. The geographic and racial/ethnic differences in incarceration rates suggest that individuals in prison may be coming from very different circumstances depending on who they are and where they were arrested. For example, homicide is the leading cause of death for African American males aged 15-19, with a rate of 63 deaths per 100,000 compared to 13 per 100,000 for Hispanic/Latino and 4 per 100,000 for White (Heron, 2019). A study of young Black men in Baltimore found that participants lost an average of three loved ones to homicide during their lifetimes (Smith, 2015). These findings would suggest that African Americans within prison populations may have higher risk for being threatened with and witnessing violence and death as well as experiencing traumatic loss when compared to counterparts of different races/ethnicities. This study aimed to identify subgroups defined by trauma histories within an incarcerated population and to explore the extent to which these subgroups vary by sociodemographic factors.

Latent Class Analysis in Intervention Research

Latent Class Analysis (LCA) is a useful tool for identifying subgroups in heterogeneous populations (Nylund, Asparouhov, & Muthén, 2007; Masyn, 2013; Lanza & Rhoades, 2013). LCA uses observed variables (such as answers to a trauma history survey) to identify the smallest number of subgroups (known as latent or unobserved classes) that can effectively characterize the covariation between these observed variables. In other words, individuals who answer the survey questions similarly are grouped together using a statistical model that best fits the data. This is why LCA is considered both person-centered and data driven. However, conducting LCA requires not only knowledge of the statistical methodology in order to identify the model that best fits the data. It also requires knowledge of the population being studied in order to identify a model that offers substantively meaningful findings. LCA has been found to be effective at identifying high-risk populations and tailoring intervention design (Lanza, 2014).

2.2 Methods

Data Source

Data for the current study was taken from the "Multisite Randomized Controlled Trial of the 5-Key Model for Reentry," conducted by the Institute for Justice Research and Development (IJRD) at Florida State University's College of Social Work (Carrie Pettus-Davis & Kennedy, 2020). The parent study collected data from 1544 participants in 4 states (Florida, Kentucky, Pennsylvania, and Texas) who were serving time in 35 state prisons. Data were collected at 5 time points, both pre- and post-release. The current study only used baseline data, collected while participants were still in prison and prior to the implementation of the 5-Key intervention.

Missing Data

There were 1,544 participants in the 5-Key RCT. For the current study, 28 observations (1.8%) were listwise deleted due to missing data. Of these, 23 (1.5%) were deleted due to missing values for at least one variable. An additional 5 (0.3%) were deleted due to indicating non-binary gender identity. This is an important subgroup in need of study in the area of trauma, particularly in the context of prisons. However, because the sample size was so small, the statistical model used in this study was not able to make interpretable estimates for this subgroup.

Measures

Measures for the current study were selected from the baseline survey instrument used in the 5-Key RCT. The 5-Key RCT survey instrument consisted of 46 validated instruments. Participants were interviewed individually and privately by trained clinicians in a prison setting approximately 6 months prior to expected release from prison. Participant answers were recorded by the interviewer using RedCap software on secure tablets. A summary of the selected measures used in the current study are summarized in Table 2.

Table 2.1. Description of Measures

Construct	Measure
Trauma Exposure	Trauma History Questionnaire (THQ), 25-item survey Childhood Trauma Questionnaire (CTQ), 28-item survey
PTSD	Mini-International Neuropsychiatric Interview (MINI), 7-question structured interview administered after the THQ
Demographic Characteristics	Demographic Survey, 6-item survey including age, race/ethnicity, gender identity, and marital status
Socioeconomic Characteristics	Education and Employment Survey, 12-item survey including pre-arrest educational level and pre-arrest employment status

Trauma Exposure

Trauma exposure type and timing were measured using two survey instruments: the Childhood Trauma Questionnaire (CTQ) and the Trauma History Questionnaire (THQ) (Bernstein et al., 2003; Green, 1996). The CTQ was administered at baseline and used to measure trauma exposures in childhood. The CTQ is a 25-question survey providing severity scores for 5 types of childhood maltreatment - emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect. Using the score cutoff for moderate to severe maltreatment, each score was first transformed into a dummy variable indicating the presence or absence of each type of maltreatment (Scher et al., 2001).

The THQ was also administered at baseline. The THQ asks 25 questions about different types of potentially traumatic experiences. Respondents indicate if they have experienced each type, how many times, and the age at which they experienced it. Researchers typically code each item according to a combination of type and timing (Yehuda et al., 2004) While respondents are

asked to indicate how many times each exposure occurred, researchers have noted that this measure on the THQ is not reliable and it is generally not used for the purposes of research (Hooper, 2011). The THQ is still amenable to measuring polyvictimization, however, since research in this area is concerned not with how many times a type of trauma exposure occurred, but with the *numbers of types* of trauma exposures and the *timing* or developmental stage at which they occurred (Finkelhor et al., 2009).

For this study, we created 10 distinct type/time trauma exposure variables using responses to the THQ and CTQ. Six indicate trauma exposures in childhood (<18) and 5 indicate trauma exposures in adulthood (≥18). While the THQ is not considered a test and does not have a standard scoring protocol, the 25 items are typically grouped into categories, depending on the needs of the research project (Hooper et al., 2011). For this study, THQ items 1-8 were combined to form the composite variable "dangerous environment," one coded for childhood and one for adulthood. These items indicated if the respondent experienced property crimes (mugging, burglary) and environmental hazards (accidents, chemical exposures). THQ items 9-16 (with the exception of item 14 which asked if the person experienced a serious illness) were combined to form the composite variable "witnessing violence and death," one for childhood and one for adulthood. These items indicate if the respondent experienced being witness or proximate to violence against others (seeing someone assaulted, finding a dead body) or experienced the violent loss of someone close to them (murdered, killed by a drunk driver).

Additional composite variables were created to capture being the victim of interpersonal violence, specifically sexual victimization (items 17-19) and physical victimization (items 20-24). These composites were created differently for childhood than for the adulthood. For adulthood, only the THQ items were used. For childhood, composites were created from both

the THQ items and CTQ scores (specifically, sexual abuse and physical abuse). If a respondent indicated childhood victimization on either the THQ or CTQ, the composite was scored to reflect the presence of this type of trauma exposure.

Each composite variable has a value of 1 or 0 (yes or no), indicating the presence or absence of that type of trauma exposure. If a participant answered yes to any item associated with one of the composite variables, the respondent received a value of 1 for that composite (e.g., adulthood physical victimization). If a participant answered no to all items associated with a composite, the respondent received a value of 0 for that composite.

In summary, there were 6 childhood trauma indicators: emotional abuse, physical abuse, sexual abuse, emotional and physical neglect, exposure to dangerous environments, and witnessing violence and death. For adulthood there were 4 trauma indicators: physical violence, sexual violence, dangerous environment, and witnessing violence and death. See Table 3 and 4 for detailed summaries of survey items used in each composite variable.

Table 2.2. THQ and CTQ Items by Composite Variable Type

Composite Variable	THQ items	CTQ items
Dangerous Environment	1 – 8	
Witnessing Violence and Death	9-13, 15, 16	
Sexual Violence Victimization	17-19	20, 21, 23, 24, 27 *(childhood only)*
Physical Violence Victimization	20-24	9, 11, 12, 15, 17 *(childhood only)*
Childhood Emotional Abuse		3, 8, 14, 18, 25
Childhood Neglect		1,2, 4-7, 13, 19, 26, 28

Table 2.3. THQ and CTQ Item Description and Scoring of Composite Variables

Composite Variable	Item Number	Question Asked on Survey	Response Options	Scoring
Dangerous Environment	THQ1	Has anyone tried to rob you or actually robbed you by using force or the threat of force, such as a mugging?	Yes No	Value = yes if any THQ item response = yes
	THQ2	Has anyone tried to rob you or actually robbed you without force or threat of force?		
	THQ3	Has anyone attempted to or succeeded in breaking into your home when you were not there?		
	THQ4	Has anyone attempted to or succeeded in breaking into your home while you were there?		
	THQ5	Have you had a serious accident at work, in a car, or somewhere else?		
	THQ6	Have you experienced a natural disaster such as a tornado, hurricane, flood, major earthquake, or other natural disasters, where you felt you or your loved ones were in danger of death or injury?		
	THQ7	Have you experienced a man-made disaster such as a train crash, building collapse, bank robbery, fire, or other man-made disasters, where you felt you or your loved ones were in danger of death or injury?		
	THQ8	Have you been exposed to dangerous chemicals or radioactivity that might threaten your health?		
Witnessing Violence and Death	THQ9	Have you seen someone seriously injured or killed?	Yes No	Value = yes if any THQ item response = yes
	THQ10	Have you seen dead bodies (other than at a funeral) or had to handle dead bodies for any reason?		
	THQ11	Have you had a close friend or family member murdered?		
	THQ12	Have you had a close friend or family member killed by a drunk driver?		
	THQ13	Excluding anyone in the above 2 questions, have you had a spouse, romantic partner, or child die?		
	THQ14	Have you received news of a serious injury, life-threatening illness, or unexpected death of someone close to you?		
	THQ15	Have you had to engage in combat while in military service in an official or unofficial war zone?		

Composite Variable	Item Number	Question Asked on Survey	Response Options	Scoring
Victim of Sexual Violence	THQ17	Has anyone made you have intercourse, oral or anal sex against your will?	Yes No	*For adulthood and post-release:* value = yes if any THQ item response = yes
	THQ18	Has anyone touched private parts of your body, or made you touch their private parts, under force or threat?		
	THQ19	Other than incidents mentioned in the last two questions, have there been any other situations in which another person tried to force you to have an unwanted sexual contact?		
	CTQ 20	Someone tried to touch me in a sexual way, or tried to make me touch them.	Never Rarely Sometimes Often Very Often	*For childhood:* value = yes if any THQ item responses = yes *and/or* CTQ score > 5*
	CTQ 21	Someone threatened to hurt me or tell lies about me unless I did something sexual with them.		
	CTQ 23	Someone tried to make me do sexual things or watch sexual things.		
	CTQ 24	Someone molested me.		
	CTQ 27	I was sexually abused.		
Victim of Physical Violence	THQ20	Has anyone, including family members or friends attacked you with a gun, knife, or some other weapon?	Yes No	*For adulthood and post-release:* value = yes if 1 or more THQ item responses = yes
	THQ21	Has anyone, including family members or friends, attacked you without a weapon and seriously injured you?		
	THQ22	Has anyone in your family beaten, spanked, or pushed you hard enough to cause injury?		
	THQ23	Have you been in any other situation in which you were seriously injured?		
	THQ24	Have you been in any other situation in which you feared you might be killed or seriously injured?		
	CTQ11	People in my family hit me so hard that it left me with bruises or marks.	Never Rarely Sometimes Often Very Often	*For childhood:* value = yes if 1 or more THQ item responses = yes *and/or* CTQ score > 7*
	CTQ9	I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.		
	CTQ12	I was punished with a belt, a board, a cord, or some other hard object.		
	CTQ15	I was physically abused.		
	CTQ17	I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor.		

Composite Variable	Item Number	Question Asked on Survey	Response Options	Scoring
Childhood Emotional Abuse	CTQ3	People in my family call me things like "stupid," "lazy," or "ugly."	Never Rarely Sometimes Often Very Often	Value = yes if CTQ score > 8*
	CTQ8	I thought that my parents wished I had never been born.		
	CTQ14	People in my family said hurtful or insulting things to me.		
	CTQ18	I felt that someone in my family hated me.		
	CTQ25	I was emotionally abused.		
Childhood Neglect**	CTQ1	I did not have enough to eat. (P)	Never Rarely Sometimes Often Very Often	Value = yes if CTQ score > 9 for emotional neglect variables and/*or* CTQ score > 7 for physical neglect variables*
	CTQ2	I knew there was someone to take care of me and protect me. (E)		
	CTQ4	My parents were too drunk or high to take care of the family. (P)		
	CTQ5	There was someone in my family who helped me feel that I was important or special. (E)		
	CTQ6	I had to wear dirty clothes. (P)		
	CTQ7	I felt loved. (E)		
	CTQ13	People in my family looked out for each other. (E)		
	CTQ19	People in my family felt close to each other. (E)		
	CTQ26	There was someone to take me to the doctor if I needed it. (P)		
	CTQ28	My family was a source of strength and support. (E)		

PTSD

Meeting criteria for a diagnosis of PTSD was measured using the Mini-International Neuropsychiatric Interview (MINI) (Lecrubier et al., 1997). The MINI is a structured diagnostic interview used to assess psychiatric disorders including PTSD. Using the clinical cut-off, the PTSD MINI variable was coded into a value indicating the presence or absence of lifetime PTSD.

Demographic Characteristics

The Demographic Survey asked 6 questions about participant characteristics. Regarding race/ethnicity, participants were asked: "Which group best describes your racial/ethnic background?" Participants were given 7 options: Black, Latino/Latina, White, Asian or Pacific Islander, Native American/Alaska Native/Inuit, Multi-racial, or Other. Participants were only allowed to select one answer. For this study, four dummy variables were created with values of 0 (no) and 1 (yes) to indicate Black, Latino/Latina, White, and Other (indicating Asian or Pacific Islander, NA/AN/I, Multi-racial, of Other). Participants were also asked: "What do you consider your gender?" They were given the options of male, female, or other. As noted in the Missing Data section of this paper, the 5 participants who indicated their gender was other were removed from the sample due to small sample size making analysis not possible given study methodology.

Participants were asked their date of birth. This data was provided by the parent study in the form of age in years at time of interview. Regarding marital status, participants were asked: "What is your current marital status?" Response options were: single, married, in a relationship, separated, divorced, widowed, and other. Two dummy variables were created from this question, one indicating if the participant was married and one indicating if the participant was not married (single, in a relationship, separated, divorced, widowed, other).

Socioeconomic Characteristics

The Education and Employment Survey asked 12 questions regarding participants' involvement in formal education and employment. Item number 11 was used in this study to capture participants' education level prior to the current incarceration. The question asked: "Prior to your incarceration, what is the highest grade of school you have completed?" Participants were given 10 options: no formal schooling, 8th grade or less, less than high school graduation, GED, high school graduation, trade or technical training, some college, associates degree, four year college graduate, graduate school degree. This question was coded into three dummy variables representing education level at time of entry into prison: less than high school graduation, high school graduation or GED, and at least some college.

Item number 8 was used to capture participants' employment status prior to the current incarceration. The question asked: "What was your work situation right before your current incarceration? Participants were given 9 options: unemployed or laid off; working full-time; working part-time; had a job but not at work because of extended illness, maternity leave, furloughed strike; stay at home parent/partner; in-school only; retired; disabled, not able to work; or in the military. This question was coded into two dummy variables representing employment prior to incarceration: working or not working. Only answers that indicated part- or full-time work were coded as working. All others were coded as not working.

Data Analysis

Data management, descriptive statistics, bivariate analyses, and graphics were conducted in SAS version 9.4 and Excel. Latent Class Analysis (LCA) was conducted in Mplus Version 8. Results were considered statistically significant if $p < 0.05$.

LCA is a statistical approach that allows for identification of an unobserved (or latent) categorical variable within a population that divides it into distinct subgroups (or latent classes) (Lanza & Rhoades, 2013). In recent years, LCA has begun to be used in intervention research (Adams et al., 2016; Charak et al., 2019). Intervention researchers are interested in identifying which interventions are most effective for which individuals, often based on individual risk factors (e.g., numbers and types of trauma exposures). LCA is a statistical approach that allows researchers to model the ways in which individuals experience a complex interaction of multiple risk factors. LCA is a powerful tool for identifying patterns within data, allowing researchers to identify specific combinations of individual characteristics in a population that can then predict treatment response (Lanza & Rhoades, 2013). Latent class membership is determined according to shared response patterns to observed indicators.

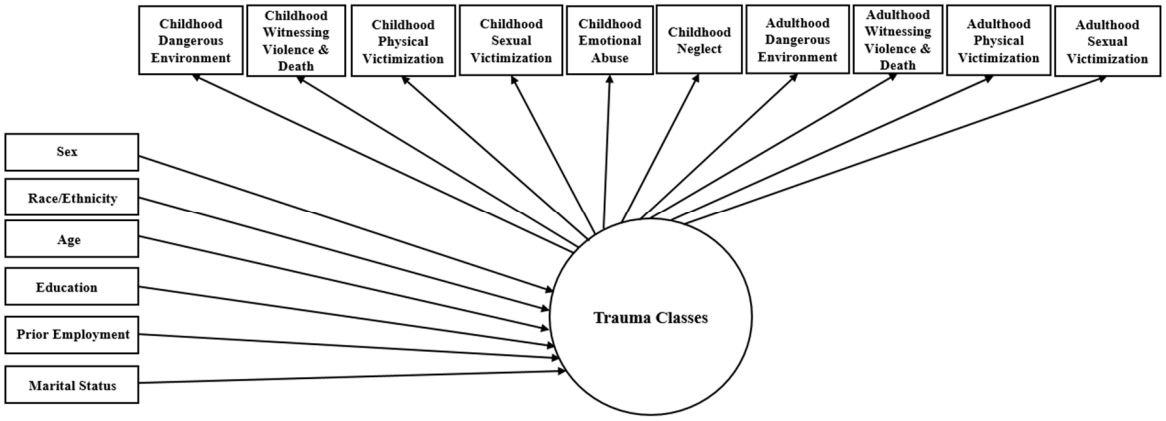
In this study, an LCA was run using 1,516 participants who completed both survey instruments as well as provided responses for all demographic and PTSD variables. Ten observed indicators, all derived from baseline data, were used. Six were indicators of childhood (<18 years old) trauma exposures: emotional abuse, physical abuse, sexual abuse, neglect, living in a dangerous environment, and witnessing violence and death. Four were indicators of adulthood (age 18 to age at baseline) trauma exposure: physical victimization, sexual victimization, living in a dangerous environment, and witnessing violence and death.

Latent class probability was used to determine the proportion of participants belonging to each trauma exposure typology. Indicators of model fit were then used to guide model selection. Fit indices included: Log-likelihood, Akaike's Information Criteria (AIC; Akaike, 1987), Bayesian Information Criteria (BIC; Schwarz, 1978), and the Lo-Mendell-Rubin (LMR) likelihood ratio test (Lo, Mendell, & Rubin, 2001). The bootstrapped likelihood ratio test

(BLRT; McLachlan & Peel, 2000) was not used because it failed to converge for all class solutions. Model selection was equally guided by evaluation of the substantive meaning of each model as by statistical indicators of model fit.

Once the optimal model was chosen, participants were categorized according to their most probable class membership and classes were described according to sociodemographic variables (sex, race/ethnicity, age, education level prior to prison, employment status prior to prison, marital status) and having met criteria for PTSD currently or in the past. The R3STEP auxiliary command in Mplus was used to conduct this stage of the analysis. This command uses Vermunt's (2010) 3-step approach. This approach is a modification of the BCH method and incorporates uncertainty regarding class membership (Asparouhov & Muthén, 2014a). The Vermunt 3-step approach involves, first, class enumeration without covariates (as described in the prior paragraph). Second, posterior probabilities are used to classify individuals to their most likely class membership while also estimating classification error. Third, associations between predictor (in this case, sociodemographic) variables and class membership are estimated using the probabilities and classification error from Step 2 (Vermunt, 2010). After each predictor was entered separately into the model, a final structural model (as represented in Figures 1) was created to include all predictors.

Figure 2.1. Path Diagram of Latent Class Model with Predictors of Latent Class Membership



Data are from The 5-Key Model for Reentry Randomized Control Trial (n=1,516).

2.3 Results

Solutions for one to six classes were explored using Mplus. A summary of the fit statistics is presented in Table 6. The log likelihood (LL) and the three information criteria (Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), and sample size adjusted Bayesian Information Criteria (aBIC)) all decreased with each additional class added to the measurement model until reaching class 5. However, the Lo-Mendel-Rubin likelihood ratio test became non-significant when comparing class three and four, indicating that the addition of a fourth class did not significantly improve fit. Mplus also determined that when a fourth class was added, it was no longer possible to estimate the parameter for one of the indicators (exposure to sexual violence in adulthood) in one of the classes. This indicated that the data was becoming too sparse for a four-class model. Taken together, the fit indices supported a three-class solution. Graphs of the estimated means of the latent class indicators for each class model were also evaluated for interpretability. Based on both the statistical and substantive results, a three-class model was selected. The smallest class in the three-class model is 29% of the sample

(n=435) and the entropy, which indicates separation between classes, is moderate but acceptable (0.632).

Table 2.5. Fit Indices for Latent One- to Six-Class Models

			Information Criteria			LMR Likelihood Ratio Test		Entropy	Smallest Class Size		Error Message
Classes	Free Parameters	Log Likelihood	AIC	BIC	aBIC	Statistic	*p*-value		n	%	
1	10	-8463.36	16946.72	16999.96	16968.19	NA	NA	NA	1,516	100	No
2	21	-7986.05	16014.09	16125.89	16059.18	942.92	<.001	0.686	621	41	No
3	32	-7885.66	15835.33	16005.69	15904.03	198.30	<.001	0.625	435	29	No
4	43	-7824.26	15734.51	15963.43	15826.84	121.31	0.232	0.632	141	9	Yes
5	54	-7782.00	15672.00	15959.49	15787.94	83.47	0.132	0.628	140	9	Yes
6	65	-7755.22	15640.44	15986.49	15780.00	52.90	0.121	0.639	64	4	Yes

Note. AIC = Akeike Information Criteria; BIC = Bayesian Information Criteria; aBIC = sample size adjusted Bayesian Information Criteria; LMR = Lo-Mendel-Rubin

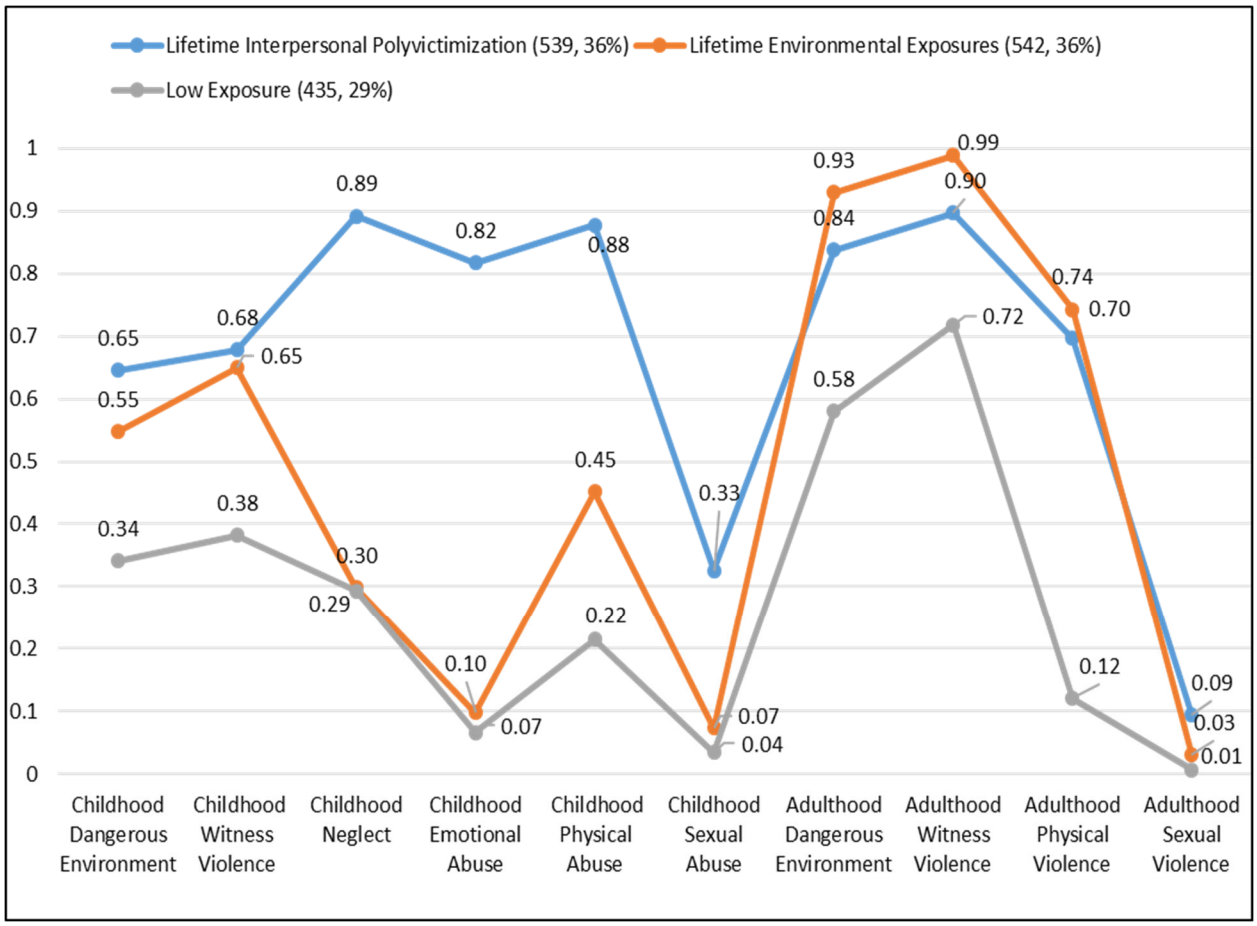
The three-class model is represented graphically in Figure 2. The smallest class (n=435, 29%) is the *Low Exposure* class, represented by the gray line. Members of this class are least likely to have experienced all forms of both childhood and adulthood trauma exposures. They had moderate levels (22-38%) of childhood exposures to dangerous environments, witnessing violence, neglect, and physical abuse. They had low levels of childhood emotional abuse (7%), and sexual abuse (4%). While their adulthood levels of exposure to dangerous environments and witnessing violence were over half (58-72%), they were lower when compared to other classes. They also continued to have lower levels of physical (12%) and sexual victimization (1%).

The two largest classes, each comprising about a third of the sample, are *Lifetime Interpersonal Polyvictimization* (n=539, 36%) represented by the blue line and *Lifetime Environmental Exposures* (n=542, 36%) represented by the orange line. The *Lifetime Interpersonal Polyvictimization* class has near universal exposure (82-89%) to three types of

childhood interpersonal trauma – neglect, emotional abuse, and physical abuse. A fourth type of childhood interpersonal trauma, sexual abuse, is also strikingly high in this class at 33%. This class also has elevated levels of childhood exposures to dangerous environments (65%) and witnessing violence and death (68%). Further, this class is characterized by high levels of adulthood exposure to dangerous environments (84%), witnessing violence (90%), and physical assault (70%). The level of sexual assault (9%) remains elevated compared to other classes as well.

The *Lifetime Environmental Exposures* class is characterized by having high levels of exposure to environmental dangers in childhood and adulthood. Childhood levels of exposure to dangerous environments (55%) and witnessing violence (65%) are similar to the *Lifetime Interpersonal Polyvictimization* class. At the same time, this class has relatively low levels of childhood interpersonal trauma exposures. Levels of childhood neglect (30%), emotional abuse (10%), and sexual abuse (7%) are similar to the *Low Exposure* class. Childhood physical abuse exposure (45%) is twice that of the *Low Exposure* class but still only about half of the *Lifetime Interpersonal Polyvictimization* class. Of note, as adults, members of this class report the highest levels of all exposures except sexual violence compared even to the *Lifetime Interpersonal Polyvictimization* class.

Figure 2.2. Estimated Means of Trauma Indicators by Class for Three-Class Model



Sample Characteristics

The study sample demographics were comparable to the demographics of the current U.S. prison population but with an overrepresentation of Black or African American participants and an underrepresentation of Latinx participants (See Table 5). The sample is 49% Black or African American, 33% White, 9%, Latinx, 6% Multiracial, and 1% Native American, Asian or Pacific Islander, or any other race/ethnicity, respectively. Nationally, the prison population is 33% Black, 31% White, 23% Hispanic (using Bureau of Justice Statistics (BJS) ethnicity designations), and 13% other. Ninety-one percent of the study sample identified as male compared to 92% of the total US prison population (Carson, 2020). The mean age of

participants is 37 years old. National data indicates that the median age of individuals in prison is between 30 and 34 (Carson, 2020). The study sample marriage rate was about half the national average (9% compared to 16%). The study sample had a comparable high school completion rate to the national average (19% vs. 21%) and a somewhat higher pre-incarceration employment rate (54% vs. 42%)(Carson et al., 2020). The study sample had lower rates of lifetime PTSD (25%) than found in other recent studies (30-60%) (Wolff et al., 2014).

Table 2.6. Characteristics of Study Sample Compared to U.S. State Prison Population

	Study Sample		U.S. Prison Population[1]	
	Percent	Mean	Percent	Mean
Race/Ethnicity				
Latinx (Hispanic)	9		23	
White	33		31	
Black or African American	49		33	
Multi-racial	6		Not Reported	
Other	3		13	
Gender				
Male	91		92	
Female	9		8	
Age		37		30-34
Marital Status				
Single (Never Married)	65		57	
Divorced or Separated	14		25	
In a Relationship	11		Not Reported	
Married	9		16	
Widowed	1		2	
Education[2]				
Did not complete high school	43		40	
Completed high school	19		21	
Completed GED	16		29	
Some higher education	21		11	
In Labor Force Prior to Prison[3]				
Yes	54		42	
No	45		58	
Mental and Behavioral Health[4]				
Lifetime PTSD	25		30-60	

1. All U.S. State Prison Population data is from Carson (2020) unless otherwise noted.
2. The most recent education data for state prison populations is from a BJS survey conducted in 2003 (Harlow, 2003).
3. Our survey asked if the participant was employed during the 6 months prior to prison. National prison population data came from a study using IRS data. The study looked at employment 2 years prior to entry into prison for individuals incarcerated between 1999 and 2014. (Looney and Turner, 2018).
4. National prison population estimate based on a large random sample of men in a Pennsylvania prison (Wolff et al. 2014).

Table 6 presents characteristics of the overall study sample compared to characteristics of each class. (Note that class characteristics are based on most-probable class membership). On most measures, the *Low Exposure* class had characteristics similar to the overall sample. The two exceptions were rate of employment and lifetime PTSD. The *Low Exposure* class had a higher level of employment (60% vs. 46%) and a lower level of PTSD (9% vs. 25%).

The *Lifetime Interpersonal Polyvictimization* class had the highest proportion of female-identifying participants (13%) while the *Lifetime Environmental Exposures* class had the lowest (6%). Similarly, the *Lifetime Interpersonal Polyvictimization* class had the highest proportion of White participants (37%) while the *Lifetime Environmental Exposures* class had the lowest (29%). The *Lifetime Environmental Exposures* class also had the highest proportion of Black participants (56%), comprising more than half of the class sample.

Measures of marital status, education, and employment each declined as the exposure severity increased, though only slightly. While 12% of the *Low Exposure* class was married, 10% of the *Lifetime Environmental Exposures* class and 9% of the *Lifetime Interpersonal Polyvictimization* class were married. While 37% of the *Low Exposure* class had a high school diploma, 35% of the *Lifetime Environmental Exposures* class and 34% of the *Lifetime Interpersonal Polyvictimization* class did. Similarly, while 60% of the *Low Exposure* class was employed prior to prison, 56% of the *Lifetime Environmental Exposures* class and 51% of the *Lifetime Interpersonal Polyvictimization* class was employed.

Lifetime PTSD increased markedly as exposure severity increased, with 9% of those in the *Low Exposure* class meeting criteria compared to 23% of those in the *Lifetime Environmental Exposures* class and 39% of those in the *Lifetime Interpersonal Polyvictimization* class.

Table 7 presents results from a structural model in which covariates predicted class membership. Seven covariates were included in the model: gender, race, marital status, education, prior employment, lifetime PTSD, and age. The reference class for interpreting the odds ratios is the *Low Exposure* class. Five covariates were statistically significant in predicting class membership: gender, race, education, employment, and lifetime PTSD.

Compared to being male, female-identifying participants were 65% less likely to belong to the *Lifetime Environmental Exposures* class than the *Low Exposure* class (OR = 0.35, 95% CI: 0.14-0.85). Gender, however, was not predictive of membership in the *Lifetime Interpersonal Polyvictimization* class. Similarly, while race was not predictive of membership in the *Lifetime Interpersonal Polyvictimization* class, compared to being White, being Black was associated with nearly twice the odds of belonging to the *Lifetime Environmental Exposures* class than to the *Low Exposure* class (OR = 1.86, 95% CI: 1.17-2.97).

Education level was also predictive of membership in the *Lifetime Environmental Exposures* class but not the *Lifetime Interpersonal Polyvictimization* class. Those not having completed high school compared to those who attended at least some college, were 45% less likely to belong to the *Lifetime Environmental Exposures* class than the *Low Exposure* class (OR = 0.55, 95% CI: 0.31-0.95). In other words, participants were almost twice as likely to be in the *Low Exposure* class if they completed some college.

Unemployment was predictive of membership in the *Lifetime Interpersonal Polyvictimization* class. Those having employment prior to incarceration were 41% less likely to belong to the *Lifetime Interpersonal Polyvictimization* class compared to those in the *Low Exposure* class (OR = 0.59, 95% CI: 0.41-0.85). Again, this means that participants were almost twice as likely to be in the *Low Exposure* class if they were employed prior to prison.

Lifetime PTSD was predictive of membership in both the *Lifetime Interpersonal Polyvictimization* class and *Lifetime Environmental Exposures* class. Having met criteria for PTSD at some point in their lifetime was associated with 13 times the odds of belonging to the *Lifetime Interpersonal Polyvictimization* class and over 5 times the odds of belonging to the *Lifetime Environmental Exposures* class (OR = 12.9, 95% CI: 6.2-27; OR = 5.6, 95% CI: 2.4-13.2).

Table 2.7. Characteristics of Sample, Overall and by Latent Class Membership (n=1,516)

	Overall Sample 1,516 (100%)	Lifetime Interpersonal Polyvictimization 539 (36%)	Lifetime Environmental Exposures 542 (36%)	Low Exposure 435 (29%)
	N(%)	**n(%)**	**n(%)**	**n(%)**
Gender				
Male	1,371 (90%)	468 (87%)	508 (94%)	395 (91%)
Female	145 (10%)	71 (13%)	34 (6%)	40 (9%)
Race				
Black	740 (49%)	236 (44%)	305 (56%)	199 (46%)
White	505 (33%)	197 (37%)	159 (29%)	66 (34%)
Latinx	138 (9%)	47 (9%)	40 (7%)	51 (12%)
Other	133 (9%)	59 (11%)	38 (7%)	36 (8%)
Marital Status				
Married	152 (10%)	48 (9%)	52 (10%)	52 (12%)
Not Married	1364 (90%)	491 (91%)	490 (90%)	383 (88%)
Education				
Less than HS Diploma	656 (43%)	246 (46%)	221 (41%)	189 (43%)
HS Diploma/GED	531 (35%)	184 (34%)	187 (35%)	160 (37%)
Some College or Tech	329 (22%)	109 (20%)	134 (25%)	86 (20%)
Prior Employment				
Part- or Full-time Work	691 (46%)	267 (51%)	195 (56%)	261 (60%)
Not Working	825 (54%)	272 (50%)	245 (45%)	174 (40%)
Lifetime PTSD				
Yes	372 (25%)	210 (39%)	123 (23%)	39 (9%)
No	1144 (75%)	329 (61%)	419 (77%)	396 (91%)
	Mean(SD)	**Mean(SD)**	**Mean(SD)**	**Mean(SD)**
Age at Interview	37 (11)	36 (10)	37 (11)	37 (12)

Table 2.8. Log Odds Coefficients and Odds Ratio for Predictors of Class Membership in a Three-Class Model, Using the Low Exposures Class as the Comparison Group

	Lifetime Interpersonal Polyvictimization n=539 (36%)				Lifetime Environmental Exposures n=542 (36%)			
	Coef	S.E.	*p*	OR (95%CI)	Coef	S.E.	*p*	OR (95%CI)
Gender								
Male	REF	--	--	--	REF	--	--	--
Female	-0.10	0.30	0.74	0.91 (0.51-1.62)	**-1.06**	**0.46**	**0.02**	**0.35 (0.14-0.85)**
Race								
White	REF	--	--	--	REF	--	--	--
Black	0.01	0.20	0.98	1.01 (0.67-1.5)	**0.62**	**0.24**	**<0.01**	**1.86 (1.17-2.97)**
Latinx	-0.07	0.31	0.82	0.93 (0.51-1.7)	-0.24	0.4	0.55	0.79 (0.36-1.72)
Other	0.32	0.32	0.32	1.4 (0.74-2.5)	-0.06	0.43	0.88	0.94 (0.41-2.17)
Marital Status								
Not Married	REF	--	--	--	REF	--	--	--
Married	-0.32	0.29	0.27	0.73(0.42-1.28)	-0.21	0.33	0.52	0.81(0.42-1.56)
Education								
Some College	REF	--	--	--	REF	--	--	--
Diploma/GED	-0.12	0.25	0.63	0.89(0.54-1.46)	-0.51	0.28	0.07	0.60(0.35-1.05)
No Diploma	-0.05	0.25	0.84	0.95(0.58-1.55)	**-0.61**	**0.28**	**0.03**	**0.55(0.31-0.95)**
Prior Employment								
Unemployed	REF	--	--	--	REF	--	--	--
Employed	**-0.52**	**0.18**	**<0.01**	**0.59(0.41-0.85)**	-0.32	0211	0.13	0.72(0.48-1.10)
Lifetime PTSD								
No	REF	--	--	--	REF	--	--	--
Yes	**2.56**	**0.38**	**<0.01**	**12.9(6.2-26.8)**	**1.73**	**0.44**	**<0.01**	**5.6(2.4-13.2)**
Age	-0.01	0.01	0.39	0.99(0.98-1.01)	-0.00	0.01	0.86	1.0(0.98-1.02)

Note. Coef=Coefficient; S.E.=Standard Error; OR = Odds Ratio; CI = Confidence Interval. Estimates in bold indicate $p<0.05$.

2.4 Discussion

This study found three subgroups of lifetime trauma exposures for incarcerated individuals in the "Multisite Randomized Controlled Trial of the 5-Key Model for Reentry." There are three main take-aways from these findings. First, the *Low Exposure* subgroup is also the smallest group, comprising just under a third of the sample, which is in contrast to findings in community samples. Second, the *Lifetime Interpersonal Polyvictimization* and the *Lifetime Environmental Exposures* classes are both characterized by high levels of multiple trauma exposures beginning in childhood and persisting into adulthood. Membership in both classes was associated with lifetime proximity to violence and death. Third, African Americans had nearly twice the odds compared to Whites of being members of the *Lifetime Environmental Exposures* class, a finding consistent with what is known about the lives of African Americans growing up in poverty in the U.S. and important to consider in intervention design.

Low Exposure

The *Low Exposure* class appears to be the subgroup experiencing trauma exposures closest to the general population norm. Using nationally representative data, Burns and colleagues (2016) conducted an LCA to classify a sample of men (mean age of 48 years) according to lifetime trauma exposures (Burns et al., 2016). The researchers selected a 4-class model with the largest class comprising 81% of the sample. This class was characterized by low levels of victimization. By contrast, in the present study, the *Low Exposure* class comprised 29% of the overall sample.

Lifetime Interpersonal Polyvictimization

One third of the study sample, 87% of whom were men, belonged to the *Lifetime Interpersonal Polyvictimization* class characterized by multiple forms of childhood maltreatment, including unusually high levels of childhood sexual abuse (33%). Levels of sexual abuse for

this class was 5-8 times that of other classes and the general population (Tjaden et al., 2000; Wolff et al., 2007; Burns et al., 2016). High levels of violence exposure and interpersonal victimization continued into adulthood for this class. Over a third (39%) of those within the *Lifetime Interpersonal Polyvictimization* class met criteria for lifetime PTSD. As noted earlier, both polyvictimization and interpersonal victimization are associated with more severe mental health outcomes and require distinct approaches to intervention (Finkelhor et al., 2011; Hamby & Grych, 2013).

Lifetime Environmental Exposures

The *Lifetime Environmental Exposures* class indicated universal exposure to dangerous environments and witnessing violence in both childhood and adulthood. This class is distinct from the *Lifetime Interpersonal Polyvictimization* class in that the types of trauma exposures indicated at the highest rates are environmental as opposed to interpersonal. African Americans made up 49% of the overall sample but made up 60% of the *Lifetime Environmental Exposures* class. Their odds of membership within this group compared to membership in the *Low Exposure* class were nearly 2 times higher than for Whites. Again, this class was characterized by environmental dangers (property crime, accidents, environmental toxins, witnessing death and injury to others, community violence). This finding is consistent with other studies regarding increased environmental risks for African American children in poverty (who tend to live in neighborhoods of concentrated disadvantage) compared to White children in poverty (Sampson, 2008).

Implications for Intervention Design

Overall, nearly three-fourths (72%) of the overall sample fell within one of two classes characterized by high risk for multiple traumatic exposures across the life course and high levels

of lifetime PTSD. Compared to the *Low Exposure* class, membership in these classes was associated with between a 5- to 13-fold increased odds of lifetime PTSD. These classes were also characterized by trauma exposure patterns that indicate a need for prevention and intervention strategies aimed at not only the individual but also the environment. The current design and operation of prisons, for example, compounds trauma exposure and poor mental health outcomes for a population in which nearly three quarters fall within classes characterized by high levels of trauma exposure beginning in childhood.

Polyvictimization research places a strong emphasis on the need for trauma-specific services for polyvictimized individuals to address contextual factors given the role of environment in polyvictimization and ongoing risk for victimization (Lussier et al., 2018). It is particularly important to note the high rate of childhood sexual abuse in a largely male subgroup. Research clearly shows the necessity of specialized mental health treatment for adult survivors of childhood sexual abuse (Pereda et al., 2009; Scoglio et al., 2021). Likewise, the *Lifetime Environmental Exposures* class is characterized by environmental dangers, again suggesting the importance of prioritizing addressing environmental risk in developing intervention strategies for incarcerated individuals (Rosen et al., 2018).

2.5 Limitations

Trauma histories are, by their nature, difficult to measure (Sotgiu & Mormont, 2008). On the one hand, they are retrospective and rely on self-report, increasing risk for bias. On the other, memories of trauma can be difficult to access given the often natural and self-protective inclination to avoid such memories (Sotgiu & Rusconi, 2014). Childhood trauma, in particular, may be inaccessible given the ways in which children's brains process traumatic experiences (Wolf & Nochajski, 2022). Researchers in the area of childhood trauma have found that the

tendency is to underreport, both the occurrence of traumatic events and the severity of those events (Goldfarb et al., 2019). Thus, while the trauma histories reported in this study indicate that 87% of the sample fell within high exposure categories, these may still be underestimates. It is also important to note that this study uses cross-sectional data to measure events occurring across the life course. Multiple measures over time are the preferred method for capturing phenomena over time given difficulties with recall.

While the characteristics of the study sample were similar to those of the national prison population, this also meant that the number of female-identifying individuals was relatively small. This made estimating the role of gender unreliable in the study. As noted earlier, non-binary participants also had to be dropped due to small sample size. Other research has demonstrated that non-binary individuals are at extremely high risk for victimization before and during incarceration and further research in this area is necessary (Brown & Jenness, 2020). While participants were asked to identify their sexual orientation and sexual orientation is also an important predictor of victimization outcomes for incarcerated individuals, this variable could not be included in this study due to issues of sample size as well.

2.6 Conclusion

The 5-Key RCT provided an important new opportunity for understanding the role of trauma in the lives of individuals in U.S. prisons. Nearly all (95%) of those in prison will eventually be released back to society and nearly all (77% within 5 years) will be re-arrested (Jeremy Travis et al., 2014). The U.S. is in a state of crisis with regards to its prison population, a crisis commonly referred to as "mass incarceration," in which those who enter prison are unlikely to ever again be able to remain out (Franklin, 2018). Understanding the life experiences of those who cycle through American prisons is necessary to developing prevention and

intervention strategies that will help resolve this crisis. Current post-release services have focused heavily on a combination of monitoring and targeting individual thinking (Andrews & Bonta, 2006). The current study offers a somewhat new way of understanding this population and their service needs. Promising new intervention strategies in the areas of trauma and polyvictimization could offer guidance and direction in developing new intervention strategies targeted to incarcerated individuals and those transitioning out of prison.

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Chapter 3: Trauma And Reentry: A Latent Class Analysis with Distal Outcomes of Lifetime Trauma Exposures for Individuals Recently Released from Prison

Abstract

This paper contributes to intervention research for individuals transitioning out of prison to society. This transition period, commonly referred to as the reentry period, is a time of great hardship and stress for individuals leaving prison as well as for those receiving them. Prior research has established that the majority of those in prison have experienced substantial trauma across the lifespan and both come from and return to impoverished environments characterized by chaos and danger. Using a subsample (n=614) of participants from the 5-Key Model for Reentry randomized control trial, this study explored the relationship between trauma exposures across the life course, including during the months after release from prison, and reentry outcomes. Using Latent Class Analysis (LCA) with distal outcomes, this study found three latent trauma classes *Lifetime Interpersonal Polyvictimization, Lifetime Environmental Exposures,* and *Low Exposure.* Each class comprised approximately one third of the sample. The two high trauma classes were each associated with different adverse reentry outcomes. Close to 40% of those in the *Lifetime Interpersonal Polyvictimization* class experienced homelessness during the reentry period and close to one-third of those in the *Lifetime Environmental Exposures* were in jail or prison by the end of the study period. Findings indicate a need for specialized assessment procedures as well as trauma-informed and trauma-specific intervention approaches tailored to each of these classes.

3.1 Introduction

This study aims to build on the findings of previous work (Morrison, 2022) and to contribute to our understanding of the role of mental health need during the year following release from prison. In this section, we begin with a description of the process of returning to society after prison. This description includes an overview of what is known about the role of trauma in this process and its relationship to adverse outcomes for individuals transitioning back to society. This section also discusses the service systems individuals typically encounter upon release. It concludes with a presentation of the research questions and a brief introduction to the statistical approach used in this study, Latent Class Analysis (LCA) with distal outcomes.

Returning to Society after Prison

Nearly all (95%) of people in prison in the U.S. will eventually be released and over 600,000 are released annually (James, 2015). According to the Bureau of Justice Statistics, 77% are re-arrested within 5 years (BJS, 2014). The process of returning to society from prison, a process commonly referred to as "reentry," is a fraught experience during which the majority of former prisoners have limited financial and social resources and face barriers to employment, housing, and basic medical and mental health care (Travis, 2005). The reentry process for most is unsuccessful. Successful reentry is threatened by poverty, substance use relapse, unmanaged chronic disease and mental health disorders, and family strain (James, 2015).

Those in the reentry process are also under heightened surveillance by the criminal justice system, increasing the likelihood of re-arrest (Palmer & Christian, 2019). Upon exiting prison, some individuals are "under supervision" through a state parole system (Ostermann et al., 2015). While the parole supervision rates vary widely by state (for example, Florida abolished parole in 1983), approximately 80% of those released from prison nationally are under some

form of supervision (Scaggs & Bales, 2015; Jeremy Travis et al., 2009). In recent decades, parole has come to focus less on services and support and more on surveillance (Jeremy Travis et al., 2009). Post-release requirements can last for years and include submitting to random drug urinalysis, receiving unscheduled home visits by officers, having to seek permission to cross a county or state line, and attendance at monthly parole check-ins (Zatz, 2020). Failing to secure housing and employment and to complete various programming, such as attending weekly AA meetings or anger management groups, can result in arrest and more time in prison (Morash et al., 2019). In 2019, about 22% of individuals in state prison were there for not meeting a requirement of their parole (The Council of State Governments Justice Center, 2019).

The Role of Trauma in the Reentry Process

Trauma complicates the reentry process for people leaving prisons and jails. This is both because of the burden of trauma they already bear upon exit as well as the continued high risk for exposure inherent in the reentry process (Wolff, et al., 2012; Pettus-Davis, et al., 2019). (Sadeh & McNiel, 2015; Van Der Kolk et al., 2005). Reentry largely involves a process of reconnecting with and relying on family, friends, service providers, and community members. Symptoms of untreated trauma, such as insomnia, hypervigilance, hyper-reactivity, difficulty with attention and concentration, and paranoia, can place substantial strain on these already taxed relationships (van der Kolk et al., 2005; Western, 2015; Sadeh & McNiel, 2015).

Despite the importance of understanding trauma treatment need as well as trauma exposure prevention during the reentry process, research in this area, particularly for men, is almost non-existent (Pettus-Davis, et al., 2019). Sociological research exploring the "hardships" and violence exposure experienced by individuals attempting to reenter society after prison, however, demonstrates a substantial need in this area (Western, et al., 2015a, p. 1512; Western,

2015b). Similarly, medical research on risk of death by violence during the months after release from prison indicates an important gap in prevention and treatment services for this population (Binswanger, et al., 2012).

For example, in an epidemiological study of over 30,000 individuals released from prison in Washington State, Binswanger and colleagues (2007) found that risk of death for this population was 12.7 times higher during the first two weeks after release than for residents of similar age, sex, and race. At no point in the 2-3 year follow-up period did risk of death fall to normal levels (Binswanger et al., 2007). The leading causes of death, overall, were drug overdose, homicide, cardiovascular disease, and suicide (Binswanger et al., 2007). Notably, for those between ages 25 and 34, death by homicide was more common than drug overdose (Binswanger, et al., 2007).

An example from the sociological research includes the findings from the Boston Reentry Study (Western, 2015, 2018; Western et al., 2015). While this study did not include measures of trauma exposure or traumatic stress symptoms, Western found that severe stress during the reentry process was both common and detrimental: "Incarceration creates a stress of transition. Prison release is a disruptive event that is often unpredictable and unfolding in a context of severe hardship. The high level of material deprivation we observed was combined with feelings of anxiety, isolation, and unease" (Western et al., 2015, p. 1540). Diagnosed mental illness was common within the study sample – reflecting the reentering population, generally – and findings indicated that the presence of mental illness was significantly associated with worse outcomes in the areas of housing, employment, and family re-integration (Western et al., 2015).

Western notes that the perspective offered by his findings "diverg[ed] from the criminal justice perspective in which offenders and victims represent distinct classes of people" (Western

et al., 2015., p. 14). Western (2015) described the poverty experienced by participants as a context in which violence emerged and individuals found themselves in multiple, interchanging roles of perpetrator, victim, and witness. He also observed that poverty increased risk for violence by creating environments characterized by chaos and an absence of informal social controls (Western et al., 2015).

Reentry Service Systems

Service systems for individuals released from prison are highly varied by location, are primarily private non-profit organizations, and no centralized reentry service system exists (Ortiz & Jackey, 2019). Services offered by these organizations also vary widely, with some providing temporary housing (such as halfway houses), some providing assistance with job searches, and some helping to connect individuals to other community services such as homeless shelters, job training centers, medical care, and substance abuse treatment (Thompkins, 2010).

Pettus-Davis and colleagues (2020) note that one of the reasons for low success rates of interventions for individuals leaving prison has to do with the nature of mass incarceration. Marginalized communities are disproportionately affected by incarceration. When individuals return to their communities, they find limited access to services and employment combined with increased likelihood for contact with the criminal justice system (Western & Muller, 2013; Miller, 2014). Pettus-Davis also notes that traditional reentry services target only problematic individual behaviors while not addressing the community barriers formerly incarcerated people face, such as policies and stigma limiting where they can live and work (Pettus-Davis et al., 2020).

Using LCA to Explore the Role of Trauma in Reentry

This study used data from the "Multisite Randomized Controlled Trial of the 5-Key Model for Reentry," conducted by the Institute for Justice Research and Development (IJRD) at Florida State University's College of Social Work (Carrie Pettus-Davis & Kennedy, 2020). Latent Class Analysis (LCA) was used to identify trauma exposure subgroups using a subsample of the 5-Key RCT (n = 614, 40%). This study included only those 5-Key participants who were released from prison during the study period and completed post-release surveys. In this study, an extension of LCA was incorporated into the analysis to estimate relationships between latent classes and reentry outcomes. Known as LCA with distal outcomes, this approach is commonly used to inform the targeting of interventions (Lanza et al., 2013). In this study, LCA with distal outcomes was used to explore the role of trauma in the reentry process and assess the extent to which trauma class predicts adverse outcomes.

3.2 Methods

Data Source

Data for the current study, as noted above, were taken from the 5-Key RCT (Carrie Pettus-Davis & Kennedy, 2020). The parent study collected data from 1544 participants in four states (Florida, Kentucky, Pennsylvania, and Texas) who were serving time in 35 state prisons. Data were collected at five time points, both pre-release (baseline) and post-release (T1-T4). The current study used data from all time points. Baseline data were collected while participants (n = 1539) were in prison, approximately six months before their expected release. About half of the baseline sample (n=723) completed at least one post-release survey. These surveys were conducted at three weeks post-release (T1), four months post-release (T2), eight months post-release (T3), and 15 months post-release (T4). The mean number of post-release time points that

participants completed surveys was 2.6 (*SD* = 1.15). That is, on average, released participants completed two or three of four possible surveys.

The current study included 614 of those participants based on the following inclusion criteria: 1) completed baseline survey, 2) completed at least one post-release survey, and 3) had no missing values for variables of interest. Five additional participants (<1%) were excluded due to indicating non-binary gender identity. This is an important subgroup in need of study in the area of trauma, particularly in the context of prisons. However, because the sample size was so small, the statistical model used in this study was not able to make interpretable estimates for this subgroup.

Measures

Measures for the current study were selected from the survey instruments used in the 5-Key RCT. The 5-Key RCT surveys consisted of 46 validated instruments. Interviews were conducted individually and privately by trained clinicians. Participant answers were recorded by the interviewer using RedCap software on secure tablets. A summary of the selected measures used in the current study are summarized in Table 1.

Table 3.1. Description of Measures

Construct	Measure
Trauma Exposure	Trauma History Questionnaire (THQ), 25-item survey Childhood Trauma Questionnaire (CTQ), 28-item survey
PTSD	Mini-International Neuropsychiatric Interview (MINI), 7-question structured interview administered at baseline, after the THQ
SUD	Mini-International Neuropsychiatric Interview (MINI), 12-question structured interview administered at baseline
Demographics	Demographic Survey, 6-item survey including age, race/ethnicity, gender identity, and marital status
Socioeconomic Status	Education and Employment Survey, 12-item survey including pre-arrest educational level and pre-arrest employment status
Service Use	Service Assessment for Children/Adults, 45-item survey asking about use of post-release services in the areas of life skills, mental health, substance use, relationships, job readiness, education, health, housing, and cognitive skills.
Arrest	Lawbreaking Survey, 11-item survey including questions about post-release interactions with the criminal justice system. The following question was used for this variable: "Since your release/last interview, have you been arrested and not charged with a crime?"
Homelessness	Housing Survey, 7-item survey including questions about post-release housing arrangements. The following question was used for this variable: "Do you consider yourself homeless?"
Unemployment	Education and Employment Survey, described above. The following question was used for this variable: "What was your employment situation during the past 6 months?"
Re-Incarceration	Housing Survey, described above. The following question was used for this variable: "Where are you living or staying now?" Participants could select "jail" as an answer.

LCA Indicators of Trauma Exposure

Trauma exposure type and timing were measured using two survey instruments: the Childhood Trauma Questionnaire (CTQ) and the Trauma History Questionnaire (THQ) (Bernstein et al., 2003; Green, 1996). See Morrison (2022) for full descriptions of the CTQ and THQ.

For this study, 14 distinct type/time trauma exposure variables were created using responses to the THQ and CTQ. Six indicate trauma exposures in childhood (age<18), 4 indicate trauma exposures in adulthood (from age ≥18 to baseline interview), and 4 indicate trauma exposures during the 15-months post-release (also known as the reentry period) . During post-release interviews, respondents were asked to report only experiences that had occurred since the last interview. THQ items were combined to form composite variables using the same approach used in Morrison (2022) (Hooper et al., 2011). Post-release composites were created following the same steps as for the adult composites, but were not coded by age. All THQ items from the post-release surveys were coded as occuring during the 15-month post-release time period. That is, the 4 post-release time points were combined to represent one time point conceptualized as the reentry period.

In summary, there were 6 childhood trauma indicators: emotional abuse, physical abuse, sexual abuse, emotional and physical neglect, exposure to dangerous environments, and witnessing violence and death. For adulthood and the reentry period there were 4 trauma indicators each: physical violence, sexual violence, dangerous environment, and witnessing violence and death. See "Trauma and Incarceration: A Latent Class Analysis of Lifetime Trauma Exposures for Individuals in Prison" (Morrison, 2022) for detailed summaries of survey items used in each composite variable.

Covariates

PTSD and SUD. The Mini-International Neuropsychiatric Interview (MINI) was used to assess the presence of PTSD and SUD (Lecrubier et al., 1997). The MINI is a structured diagnostic interview used to assess psychiatric disorders. Using the clinical cut-off, the PTSD MINI variable was coded into a value indicating the presence or absence of PTSD at some point in the respondent's life. Similarly, the SUD MINI was used to assess meeting criteria at some

point in the respondent's life for an SUD. If the respondent met criteria for mild, moderate, or severe SUD currently or in the past, lifetime SUD was scored as present.

Demographics and Socioeconomic Status. See Morrison (2022) for descriptions of these variables.

Service Use after Release from Prison. The Service Assessment for Children/Adults (SACA) was used to identify individuals who engaged in post-release services. The SACA is a 45-item survey that asks about the use of 9 types of services: life skills, mental health, substance use, relationships, job readiness, education, health, housing, and cognitive skills. Nine items from the survey were used to construct this variable (2, 7, 12, 17, 22, 27, 32, 37, and 42). Each item corresponds with each type of service. For example, regarding life skills service use, item 2 asks: "Since the last interview, did you get help for things like budgeting, time management, understanding your credit score, shopping for food, or other similar activities?" Respondents can indicate "yes" or "no." The SACA was administered at each post-release time point. For this study, if a respondent indicated use of any of the 9 service types at any post-release time point, the respondent received a value of 1 for the service use variable. If they indicated they did not engage in any of the 9 services, they received a value of 0 for service use.

Distal Outcomes

Participants were asked about their housing status, employment status and if they were re-arrested and re-incarcerated during post-release surveys. Each of these measures are commonly used to assess the reentry experience (Berg & Huebner, 2011; Ndrecka, 2014; Carrie Pettus-Davis, Renn, Veeh, et al., 2019).

This study explored four adverse reentry outcomes: arrest, homelessness, unemployment, and re-incarceration (i.e., being held in jail). Each outcome was captured by one

dummy variable each. In other words, the participant experienced this outcome (1) or they did not (0). For arrest and homelessness, participant responses at all post-release time points were considered. If the participant indicated that they were arrested or homeless at any point, they received values of 1 for those variables. For unemployment and re-incarceration, only the response given during a participant's last interview was used. The goal was to capture the respondent's situation the last time the study had contact with them. For details about the questions used to create each variable, see Table 2.

Data Analysis

Data management, descriptive statistics, bivariate analyses, and graphics were conducted in SAS version 9.4 and Excel. Latent Class Analysis (LCA) was conducted in Mplus Version 8. Results were considered statistically significant if $p \leq 0.05$. In this study, an LCA was run using 614 participants who completed trauma survey instruments and also provided responses for all covariate and outcome variables. Fourteen observed trauma exposure indicators were used.

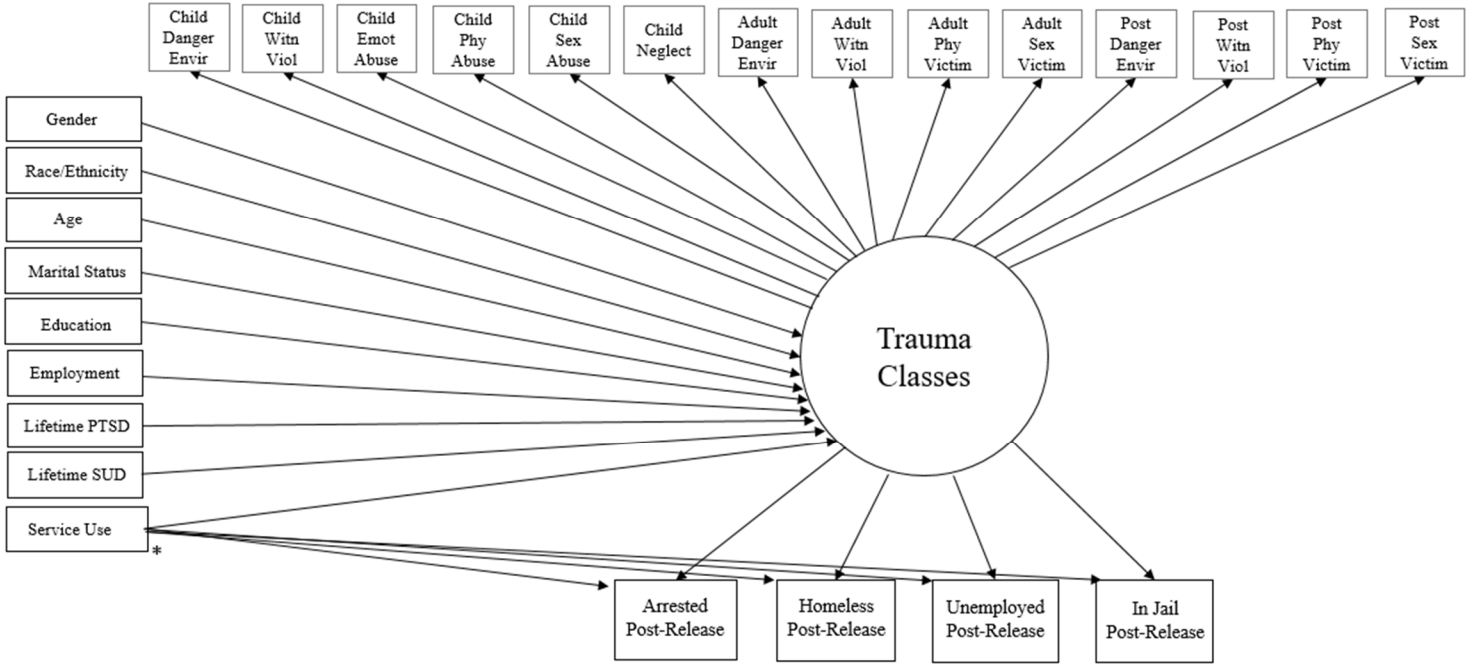
Latent class probability was used to determine the proportion of participants belonging to each trauma exposure typology. Indicators of model fit were then used to guide model selection. Fit indices included: Log-likelihood, Akaike's Information Criteria (AIC; Akaike, 1987), Bayesian Information Criteria (BIC; Schwarz, 1978), and the Lo-Mendell-Rubin (LMR) likelihood ratio test (Lo, Mendell, & Rubin, 2001). The bootstrapped likelihood ratio test (BLRT; McLachlan & Peel, 2000) was not used because it failed to converge for all class solutions. Model selection was equally guided by evaluation of the substantive meaning of each model as by statistical indicators of model fit.

Once the optimal model was chosen – specifically, the 3-class model - predictors and distal outcomes of class membership were added to the analysis using the BCH method in Mplus

(Asparouhov & Muthén, 2014b; Bolck et al., 2004). The BCH method is considered the preferred method for assessing these relationships because it is able to prevent classes from shifting as variables are added while also accounting for measurement error (Asparouhov & Muthén, 2014a, 2014b; Bakk et al., 2013; Bakk & Vermunt, 2016). The BCH method was performed manually in Mplus in a 3-step process. First, the 3-class model was estimated without covariates. Second, BCH weights were created and saved. Third, the BCH weights were used to estimate the auxiliary structural model, that is, the model with the predictors, outcomes, and direct effects. Using this method, latent class membership is treated as an "observed" or "known" variable to prevent classes from shifting while, at the same time, the BCH weights account for the measurement error.

These three steps were conducted manually to allow for the incorporation of the direct effects of each predictor on the outcome. Because it was not assumed that the relationships between the predictors and outcomes were completely mediated through the latent class membership, formal tests of the inclusion of each predictor in the structural model were not conducted. The Wald test and pairwise comparison z-tests were used to determine differences in the prevalence of each outcome across the three classes. In this analysis, the relationships between the latent classes and the outcomes were estimated while controlling for all predictors. Figure 1 is a path diagram of the final structural model. Statistically significant results were assessed at the 0.05 level. However, due to the relatively small sample size, results that were approaching statistical significance at the 0.06 level were also noted in the results.

Figure 3.1. Path Diagram of Latent Class Model with Covariates and Outcomes



Note: Danger = Dangerous, Envir = Environment, Witn = Witness, Viol = Violence, Emot = Emotional, Phy = Physical, Sex = Sexual, Victim = Victimization, Post = Post-Release. Data are from The 5-Key Model for Reentry Randomized Control Trial (n=614). *For diagram simplicity, direct effects from all covariates to each outcome are not displayed.

3.3 Results

Latent Class Model

Solutions for one to four classes were explored using Mplus. A summary of the fit statistics is presented in Table 2. The log likelihood (LL) and the three information criteria (Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), and sample size adjusted Bayesian Information Criteria (aBIC) all decreased with each additional class added to the measurement model until reaching class 4. The Lo-Mendel-Rubin likelihood ratio test also became non-significant when comparing classes three and four, indicating that the addition of a fourth class did not significantly improve fit. Taken together, the fit indices supported a three-class solution. Graphs of the estimated means of the latent class indicators for each class model were also evaluated for interpretability. Based on both the statistical and substantive results, a three-class model was selected. The smallest class in the three-class model is 31% of the sample (n=190) and the entropy, which indicates separation between classes, is moderate but acceptable (0.65).

Table 3.2. Fit Indices for Latent One- to Six-Class Models

			Information Criteria			LMR Likelihood Ratio Test		Entropy	Smallest Class Size		Error Message
Classes	Free Parameters	Log Likelihood	AIC	BIC	aBIC	Statistic	*p*-value		n	%	
1	14	-4338.652	8705.304	8767.184	8722.737	NA	NA	NA	614	100	No
2	29	-4118.567	8295.134	8423.313	8331.244	440.171	<0.001	0.74	228	37%	No
3	44	-4062.829	8213.658	8408.138	8268.447	111.475	0.05	0.65	190	31%	Yes
4	59	-4026.070	8170.140	8430.919	8243.606	73.519	0.16	0.75	124	20%	Yes

Note. AIC = Akeike Information Criteria; BIC = Bayesian Information Criteria; aBIC = sample size adjusted Bayesian Information Criteria; LMR = Lo-Mendel-Rubin

The three-class model is represented graphically in Figure 2. Each class comprised approximately one third of the sample and each had roughly the same trauma type/timing

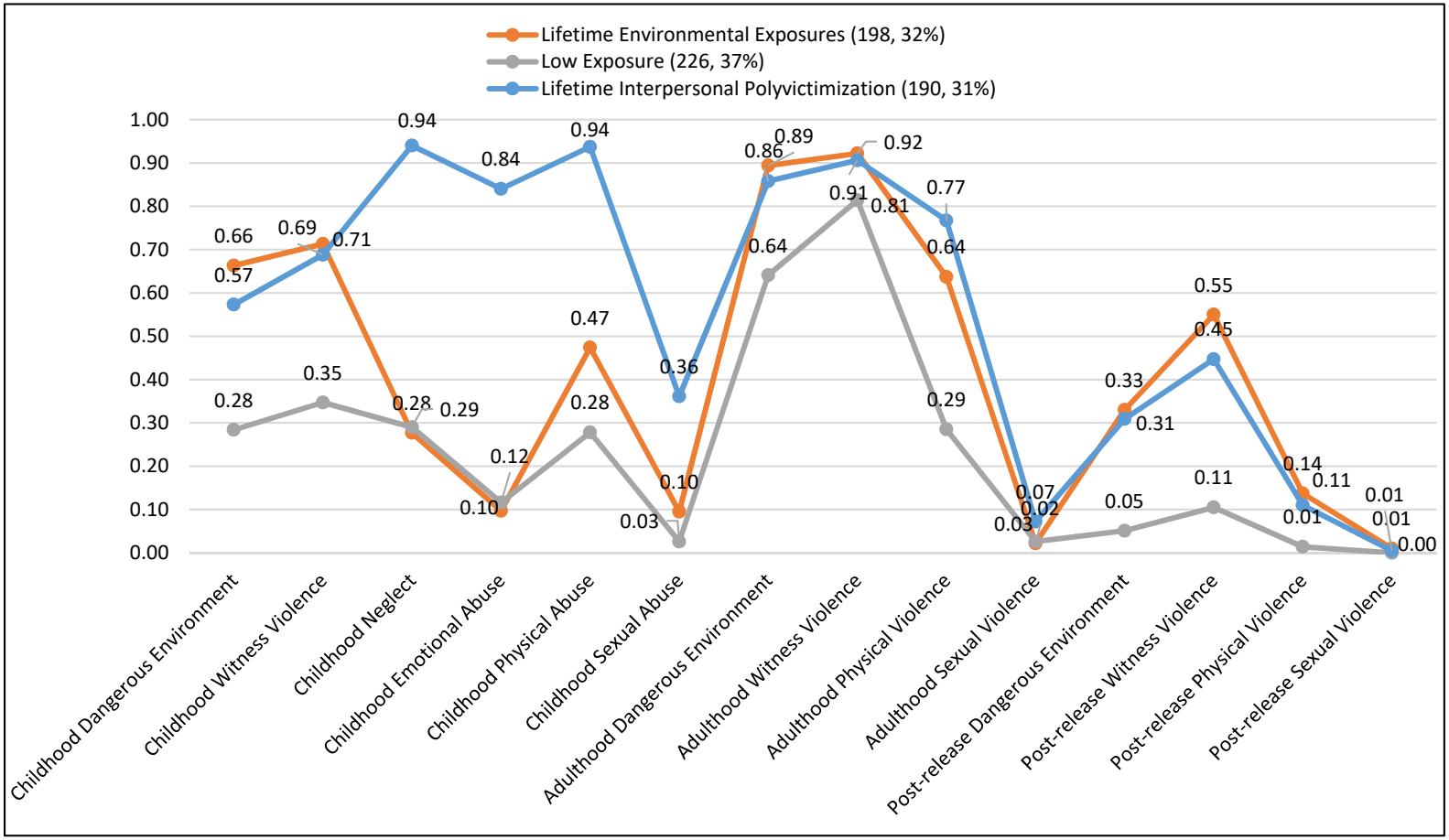
probabilities. The *Low Exposure* class (n=226, 37%), represented by the gray line, was the largest class. Members of this class were least likely to have experienced all forms of childhood, adulthood, and post-release trauma exposures. They had moderate levels (28-35%) of childhood exposures to dangerous environments, witnessing violence, neglect, and physical abuse. They had low levels of childhood emotional abuse (12%), and sexual abuse (3%). While their adulthood levels of exposure to dangerous environments and witnessing violence were high (64-81%), they were lower when compared to other classes. They also continued to have lower levels of physical (29%) and sexual victimization (3%) in adulthood. The *Low Exposure* class indicated very little trauma exposure in the post-release period. The level of exposure to witnessing violence was the highest trauma type, at 11%, while sexual victimization was absent, physical victimization was 1%, and dangerous environmental exposures were 5%.

The two high exposure classes, which combined comprised over 60% of the sample, are the *Lifetime Interpersonal Polyvictimization* (n=190, 31%), represented by the blue line, and the *Lifetime Environmental Exposures* (n=198, 32%), represented by the orange line. The *Lifetime Interpersonal Polyvictimization* class had near universal exposure (84-94%) to three types of childhood interpersonal trauma – neglect, emotional abuse, and physical abuse. A fourth type of childhood interpersonal trauma, sexual abuse, was also strikingly high in this class at 36%. This class also had elevated levels of childhood exposures to dangerous environments (57%) and witnessing violence and death (69%). This class was characterized by high levels of adulthood exposure to dangerous environments (86%), witnessing violence (91%), and physical assault (77%). The level of sexual assault (7%) remained elevated compared to other classes as well. During the 15-month post-release period, this class continued to experience relatively high levels of trauma exposure, with close to a third (31%) experiencing dangerous environmental exposures

and close to half (45%) witnessing violence to others. The level of physical victimization was 11% and the level of sexual violence was 1%.

The *Lifetime Environmental Exposures* class was characterized by having high levels of exposure to environmental dangers in childhood and adulthood. Childhood levels of exposure to dangerous environments (66%) and witnessing violence (71%) were similar to the *Lifetime Interpersonal Polyvictimization* class. At the same time, this class had relatively low levels of childhood interpersonal trauma exposures. Levels of childhood neglect (28%) and emotional abuse (10%) were similar to those for the *Low Exposure* class. Childhood physical abuse exposure (47%) and childhood sexual abuse (10%) were about twice that of the *Low Exposure* class but still less than half of the *Lifetime Interpersonal Polyvictimization* class. As adults and during the post-release period, members of this class reported the highest levels of all exposures except sexual violence compared even to the *Lifetime Interpersonal Polyvictimization* class.

Figure 3.2. Estimated Means of Trauma Indicators by Class for Three-Class Model



Sample Characteristics

The 5-Key RCT participant demographic and socioeconomic characteristics were similar to the current U.S. state prison population (see Morrison, 2022). Comparing the 5-Key RCT participants who were included in this study (n=614) with those who were not (n=930), four small but statistically significant differences were found in demographic, socioeconomic, and mental health characteristics (See Table 3). First, there were racial/ethnic differences (x^2(6, n=1536) = 22.23, p=0.001). Compared to the rest of the sample, the subsample used in the study had a higher proportion of Black participants (51% compared to 47%), a lower proportion of White participants (32% compared to 34%), and a lower proportion of Latinx participants (6% compared to 11%). Second, those in the study were less likely to be married (8% compared to 11%; x^2(6, n=1536) =18.14, p=.001). They were also more likely to have been employed prior to prison (58% compared to 51%; x^2(8, n=1523) = 22.27, p=0.004). Those in the study were also, on average, younger than those not in the study (M = 36 vs. 38 years old; t (1534) = -0.31, p=0.001).

Table 3.3. Comparison of Characteristics of Subsample (n=614) of 5-Key RCT Participants Included in Study to Those Not Included (n=930)

		Subsample Included in Study n=614 (40%)	Subsample Not Included in Study n=930(60%)	Chi-square Goodness of Fit Tests
		n(%)	**n(%)**	
Gender	Male	557 (91%)	830 (89%)	x^2(2, n = 1538) = 3.40, p = 0.18
	Female	57 (9%)	89 (10%)	
			Non-binary = 5 (0.5%)	
			Missing = 6 (0.5%)	
Race/Ethnicity	Black	316 (51%)	435 (47%)	**x^2(6, n = 1536) = 22.23, p = 0.001**
	White	211 (34%)	299 (32%)	
	Latinx	35 (6%)	104 (11%)	
	Other	52 (8%)	84 (9%)	
			Missing = 8 (0.9%)	
Married	Yes	50 (8%)	104 (11%)	**x^2(6, n =1536) = 18.14, p = 0.001**
	No	564 (92%)	818 (88%)	
			Missing = 8 (0.9%)	
High School Diploma	Yes	363 (59%)	501 (54%)	x^2(9, n=1523) = 13.54, p = 0.14
	No	251 (41%)	408 (44%)	
			Missing = 21 (2%)	
Worked Before Prison	Yes	358 (58%)	471 (51%)	**x^2(8, n=1523) = 22.27, p=0.004**
	No	256 (42%)	438 (47%)	
			Missing = 21(2%)	
Lifetime PTSD	Yes	145 (24%)	231 (25%)	x^2(1, n=1539) = 0.06, p = 0.81
	No	469 (76%)	699 (75%)	
			Missing = 5 (0.3%)	
Lifetime SUD	Yes	365 (59%)	553 (59%)	x^2(1, n=1539) = 0.02, p = 0.89
	No	249 (41%)	372 (40%)	
			Missing = 5 (0.3%)	
		Mean(SD)	**Mean(SD)**	**Two-sample *t* test**
Age at Baseline		38 (11)	36 (11)	***t*(1534) = -3.31, p = 0.001**
			Missing = 8 (0.9%)	

Sample Characteristics by Class Membership

Table 4 presents characteristics of the overall study sample compared to characteristics of each class. (Note that class characteristics are based on most-probable class membership). The *Low Exposure* class had characteristics similar to the overall sample in terms of gender, marital status, and educational and employment status. Differences included race/ethnicity, with the *Low Exposure* class having a higher proportion of Black participants (60% compared to 51%), and a lower proportion using post-release services (53% compared to 62%). Fewer also have lifetime SUD (49% compared to 59%) and lifetime PTSD compared to the overall sample (10% compared to 24%).

The *Lifetime Interpersonal Polyvictimization* class had rates of marriage, education, and pre-arrest employment similar to the overall sample. Proportions of male and female participants were also similar. Differences include the proportion of Black participants, which was lower in the *Lifetime Interpersonal Polyvictimization* class compared to the overall sample (44% vs. 51%). Service use (75% compared to 62%), lifetime PTSD (44% compared to 24%) and lifetime SUD (72% compared to 59%) were all proportionally higher for the *Lifetime Interpersonal Polyvictimization* class.

The *Lifetime Environmental Exposures* class had the lowest proportion of female-identified participants (6%), compared to both the overall sample (9%) and other classes (10% *Low Exposure* and 12% *Lifetime Interpersonal Polyvictimization*). This class was similar to the overall sample in all other characteristics.

Table 3.4. Characteristics of Sample, Overall and by Latent Class Membership (N = 614)

	Overall Sample	Low Exposure	Lifetime Interpersonal Polyvictimization	Lifetime Environmental Exposures
	614 (100%)	226 (37%)	190 (31%)	198 (32%)
	N(%)	**n(%)**	**n(%)**	**n(%)**
Gender				
Male	557 (91%)	203 (90%)	167 (89%)	187 (94%)
Female	57 (9%)	23 (10%)	23 (12%)	11 (6%)
Race/Ethnicity				
Black	316 (51%)	135 (60%)	83 (44%)	98 (49%)
White	211 (34%)	70 (31%)	72 (38%)	69 (35%)
Latinx	35 (6%)	13 (6%)	13 (7%)	9 (5%)
Other	52 (8%)	8 (4%)	22 (12%)	22 (11%)
Married				
Yes	50 (8%)	15 (7%)	19 (10%)	16 (8%)
No	564 (92%)	211 (93%)	171 (90%)	182 (92%)
High School Diploma				
Yes	363 (59%)	127 (56%)	11 (58%)	125 (63%)
No	251 (41%)	99 (44%)	79 (42%)	73 (37%)
Worked Before Prison				
Yes	358 (58%)	141 (62%)	100 (53%)	117 (59%)
No	256 (42%)	85 (38%)	90 (47%)	81 (41%)
Used Services After Prison				
Yes	383 (62%)	120 (53%)	142 (75%)	121 (61%)
No	231 (38%)	106 (47%)	48 (25%)	77 (39%)
Lifetime PTSD				
Yes	145 (24%)	22 (10%)	84 (44%)	39 (20%)
No	469 (76%)	204 (90%)	106 (56%)	159 (80%)
Lifetime SUD				
Yes	365 (59%)	111 (49%)	136 (72%)	118 (60%)
No	249 (41%)	115 (51%)	54 (28%)	80 (40%)
	Mean(SD)	**Mean(SD)**	**Mean(SD)**	**Mean(SD)**
Age at Baseline	38 (11)	39 (12)	37 (11)	37 (11)

Predictors of Class Membership

Table 5 presents results from a structural model in which covariates predicted class membership. Nine covariates were included in the model: gender, race/ethnicity, age, marital status, educational status, employment before prison, service use after prison, lifetime PTSD, and lifetime SUD. The reference class for interpreting the odds ratios is the *Low Exposure* class. Six covariates were statistically significant in predicting class membership: gender, employment, service use, lifetime PTSD, lifetime SUD, and age.

First, women were 80% less likely to belong to the *Lifetime Environmental Exposures* class than to the *Low Exposure* class (OR = 0.20, 95% CI: 0.04-0.96). Second, having a job prior to prison was associated with about half the likelihood of belonging to the *Lifetime Interpersonal Polyvictimization* class compared to the *Low Exposure* class (OR = 0.51, 95% CI: 0.28-0.95). Said another way, if a participant was working at the time of their arrest, they were twice as likely to be in the *Low Exposure* class. Third, using services after release from prison was associated with a three-fold increased likelihood of membership in the *Lifetime Interpersonal Polyvictimization* class compared to the *Low Exposure* class (OR = 2.87, 95% CI: 1.50-5.50).

The fourth covariate, lifetime PTSD, was associated with membership in both of the high trauma classes. Meeting criteria for lifetime PTSD was associated with a 12-fold higher likelihood of belonging to the *Lifetime Interpersonal Polyvictimization* class compared to the *Low Exposure* class (OR = 12.6, 95% CI: 4.9-32.2). Meeting criteria for lifetime PTSD was also associated with a 3-fold higher likelihood of belonging to the *Lifetime Environmental Exposures* class (OR = 3.32, 95% CI: 1.06-10.4).

The fifth covariate, lifetime SUD, was associated with membership in the *Lifetime Interpersonal Polyvictimization* class but not with membership in the *Lifetime Environmental Exposures* class. For those meeting criteria for lifetime SUD, their odds of being in the *Lifetime Interpersonal Polyvictimization* class was three times that of being in the *Low Exposure* class (OR = 2.98, 95% CI: 1.55-5.72).

The sixth and last covariate, age, was associated with membership in both high trauma classes. For each year increase in age, odds of membership in either high trauma class decreased by 3% (OR = -0.03, 95% CI: 0.94-1.00). In other words, younger participants were more likely to be in one of the high trauma exposure classes while older participants were more likely to be in the *Low Exposure* class.

Table 3.5. Log Odds Coefficients and Odds Ratio for Predictors of Class Membership in a Three-Class Model, Using the Low Exposures Class as the Comparison Group (N= 614)

		Lifetime Interpersonal Polyvictimization n=190 (31%)				**Lifetime Environmental Exposures** n=198 (32%)			
		Coef	S.E.	*p*	OR (95%CI)	Coef	S.E.	*p*	OR (95%CI)
Gender	Male	REF	--	--	--	REF	--	--	--
	Female	-0.86	0.53	0.10	0.42(0.15-1.20)	**-1.64**	**0.82**	**0.045**	**0.20(0.04-0.96)**
Race	White	REF	--	--	--	REF	--	--	--
	Black	-0.52	0.33	0.12	0.60(0.31-1.14)	-0.36	0.36	0.31	0.70(0.34-1.41)
	Latinx	0.47	0.61	0.44	1.60(0.48-5.30)	-0.43	0.76	0.57	0.65(0.15-2.88)
	Other	2.15	1.19	0.07	8.59(0.84-88.1)	2.12	1.30	0.10	8.34(0.66-106)
Married	No	REF	--	--	--	REF	--	--	--
	Yes	1.01	0.59	0.09	2.74(0.87-8.7)	0.76	0.68	0.26	2.14(0.57-8.07)
High School Diploma	No	REF	--	--	--	REF	--	--	--
	Yes	0.39	0.32	0.22	1.47(0.79-2.74)	0.62	0.34	0.07	1.86(0.96-3.61)
Worked Before Prison	No	REF	--	--	--	REF	--	--	--
	Yes	**-0.67**	**0.31**	**0.03**	**0.51(0.28-0.95)**	-0.36	0.34	0.30	0.70(0.36-1.36)
Used Services After Prison	No	REF	--	--	--	REF	--	--	--
	Yes	**1.06**	**0.33**	**<0.01**	**2.87 (1.50-5.50)**	0.46	0.34	0.17	1.58(0.82-3.1)
Lifetime PTSD	No	REF	--	--	--	REF	--	--	--
	Yes	**2.53**	**0.48**	**<0.01**	**12.6(4.9-32.2)**	**1.20**	**0.58**	**0.04**	**3.32(1.06-10.4)**
Lifetime SUD	No	REF	--	--	--	REF	--	--	--
	Yes	**1.09**	**0.33**	**<0.01**	**2.98 (1.55-5.72)**	0.55	0.33	0.10	1.73(0.90 – 3.3)
Age at Baseline		**-0.03**	**0.02**	**0.05**	**0.97 (0.94-1.00)**	**-0.03**	**0.02**	**0.03**	**0.97(0.94-1.00)**

Note. Coef=Coefficient; S.E.=Standard Error; OR = Odds Ratio; CI = Confidence Interval; NA = Not available due to small N size. Estimates in bold indicate p≤0.05.

Reentry Outcomes

Table 6 presents the characteristics of the overall sample to compare with characteristics of those who had each of the four reentry outcomes. The four reentry outcomes were: arrest, homelessness, unemployment, and re-incarceration (i.e., being held in jail). During the 15-month post-release period, 42% (n=256) of the sample were arrested at some point and 25% (n=155) were homeless at least part of the time. By the last time the 5-Key RCT had contact with study participants, 35% (n=217) were unemployed and 22% (n=138) were in jail.

Compared to the overall sample, participants who experienced arrest were more likely to have a lifetime SUD (67% compared to 59%) and tended to be slightly younger (36 years compared to 38 years old). Participants who experienced homelessness were more likely to meet criteria for lifetime PTSD (33% compared to 24%) and tended to be older (42 years). Those experiencing unemployment were also more likely to experience lifetime PTSD (30%) and were much less likely to have been employed prior to prison (45% compared to 58%) when compared to the overall sample. For those who were in jail at last contact with the study, they were more likely to meet criteria for lifetime SUD (67% compared to 59%) and less likely to have their high school diploma (50% compared to 59%)

Table 3.6. Characteristics and Reentry Outcomes in Overall Sample and by Outcome Category (n = 614)

	Overall Sample	Arrested at Some Point Since Release	Homeless at Some Point Since Release	Unemployed at Last Interview	In Jail at Last Interview
	614 (100%)	256 (42%)	155 (25%)	217 (35%)	138 (22%)
	N(%)	n(%)	n(%)	n(%)	n(%)
Gender					
Male	557 (91)	236 (92)	51 (93)	188 (87)	131 (95)
Female	57 (9)	20 (8)	4 (7)	29 (13)	7 (5)
Race/Ethnicity					
Black	316 (51)	126 (49)	77 (50)	103 (47)	72 (52)
White	211 (34)	96 (38)	58 (37)	82 (32)	50 (36)
Latinx	35 (6)	12 (5)	7 (5)	8 (4)	6 (4)
Other	52 (8)	22 (9)	13 (8)	24 (11)	10 (7)
Married					
Yes	50 (8)	17 (7)	10 (6)	16 (7)	8 (6)
No	564 (92)	239 (93)	145 (94)	201 (93)	130 (94)
High School Diploma					
Yes	363 (59)	141 (55)	104 (67)	116 (53)	69 (50)
No	251 (41)	115 (45)	51 (33)	101 (47)	69 (50)
Worked Before Prison					
Yes	358 (58)	140 (55)	91 (59)	98 (45)	77 (56)
No	256 (42)	116 (45)	64 (41)	119 (55)	61 (44)
Used Services After Prison					
Yes	383 (62)	153 (60)	113 (73)	145 (67)	77 (56)
No	231 (38)	103 (40)	42 (27)	72 (33)	61 (44)
Lifetime PTSD					
Yes	145 (24)	61 (24)	51 (33)	65 (30)	29 (21)
No	469 (76)	195 (76)	104 (67)	152 (70)	109 (79)
Lifetime SUD					
Yes	365 (59)	171 (67)	90 (58)	133 (61)	91 (67)
No	249 (41)	85 (33)	65 (42)	84 (39)	47 (34)
	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)
Age at Baseline	38 (11)	36 (11)	42 (12)	39 (12)	36 (11)

Note. SD = Standard Deviation

Direct Effects of Covariates on Outcomes

When adjusted for latent class membership, five covariates had direct effects on reentry outcomes: education, prior employment, lifetime PTSD, lifetime SUD, and age (see Table 7). First, having a high school diploma was associated with a 40% decreased odds of being unemployed (OR = 0.61, 0.42-0.89) and a 35% decreased odds of being in jail (OR = 0.64, 95% CI: 0.42-0.97). Conversely, having a diploma was associated with a 45% *increased* odds of being homeless (OR = 1.54, 95% CI: 0.99-2.39), although this relationship did not achieve statistical significance at the p=0.05 level (p=0.054). This result should be interpreted cautiously and in context. For those facing the challenges of exiting the criminal justice system, homelessness may be a preferred outcome to jail to the extent that it means continued "freedom" (Lowenstein, 2016; Rankin, 2019). Thus, a high school diploma, while associated with an adverse outcome (homelessness), may still be functioning as a protective factor to the extent that one way to not be in jail is to be homeless.

The second covariate with a direct effect was having a job prior to prison. Those employed before prison were 60% less likely to experience unemployment after prison (OR = 43, 95% CI: 0.30-0.61). The third covariate, lifetime PTSD, was predictive of post-release unemployment, with those having lifetime PTSD having a 70% greater chance of being unemployed (OR = 1.68, 95% CI: 1.07-2.65). The fourth covariate, lifetime SUD, was predictive of arrest. For those who met criteria for lifetime SUD, odds of arrest were 50% higher than for those who did not (OR = 1.49, 95% CI: 1.03-2.15). Lastly, age was predictive of three outcomes: arrest, homelessness, and unemployment. Being younger increased risk for arrest (OR = 0.98, 95% CI: 0.97-1.00) while being older increased risk for homelessness (OR = 1.04, 95% CI: 1.03-1.06) and unemployment (OR = 1.02, 95% CI: 1.00-1.04).

Table 3.7. Direct Effects of Covariates on Reentry Outcomes Adjusted for Latent Class Membership of Trauma Exposures (N= 614)

	Arrested at Some Point During Post-Release Period n = 256 (42%)			**Homeless at Some Point During Post-Release Period** n = 155 (25 %)			**Unemployed at Last Interview** n = 218 (35%)			**In Jail at Last Interview** n = 139 (23%)		
	Coef (SE)	p	OR (95%CI)	Coef (SE)	p	OR (95%CI)	Coef (SE)	p	OR (95%CI)	Coef (SE)	p	OR (95%CI)
Gender												
Male	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Female	-0.27(0.31)	0.38	0.76(0.41-1.40)	-0.63(0.38)	0.10	0.53(0.25-1.13)	0.56(0.34)	0.10	1.75(0.91-3.38)	-0.57(0.45)	0.20	0.56(0.23-1.36)
Race												
White	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Black	-0.23(0.19)	0.23	0.79(0.54-1.16)	-0.17(0.23)	0.46	0.84(0.53-1.33)	-0.39(0.21)	0.062	0.68(0.45-1.02)	-0.12(0.23)	0.60	0.89(0.57-1.39)
Latinx	-0.53(0.42)	0.21	0.59(0.26-1.34)	-0.42(0.43)	0.33	0.66(0.29-1.52)	-0.73(0.43)	0.09	0.48(0.21-1.11)	-0.52(0.52)	0.31	0.59(0.22-1.64)
Other	-0.28(0.34)	0.42	0.76(0.39-1.47)	-0.13(0.42)	0.75	0.88(0.39-1.99)	0.17(0.37)	0.63	1.19(0.58-2.44)	-0.44(0.43)	0.30	0.64(0.28-1.49)
Married												
No	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Yes	-0.12(0.33)	0.71	0.88(0.46-1.69)	-0.72(0.44)	0.10	0.49(0.21-1.15)	-0.21(0.33)	0.51	0.81(0.43-1.53)	-0.23(0.43)	0.60	0.80(0.34-1.85)
High School Diploma												
No	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Yes	-0.23(0.18)	0.20	0.79(0.55-1.13)	**0.43(0.22)**	**0.05**	**1.54(0.99-2.39)**	**-0.49(0.20)**	**0.01**	**0.61(0.42-0.89)**	**-0.45(0.21)**	**0.03**	**0.64(0.42-0.97)**
Worked Before Prison												
No	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Yes	-0.24(0.18)	0.17	0.78(0.56-1.13)	0.02(0.21)	0.94	1.02(0.67-1.55)	**-0.85(0.18)**	**<0.01**	**0.43(0.30-0.61)**	-0.12(0.20)	0.55	0.89(0.59-1.32)
Used Services After Prison												
No	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Yes	-0.17(0.19)	0.38	0.85(0.59-1.22)	0.31(0.23)	0.17	1.37(0.87-2.15)	0.21(0.20)	0.30	1.23(0.833-1.82)	-0.26 (0.22)	0.23	0.77(0.50-1.18)
Lifetime PTSD												
No	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Yes	0.04(0.22)	0.88	1.04(0.67-1.61)	0.35(0.27)	0.20	1.41(0.83-2.40)	**0.52(0.23)**	**0.03**	**1.68(1.07-2.65)**	-0.04(0.27)	0.88	0.96(0.56-1.64)
Lifetime SUD												
No	REF	--	--	REF	--	--	REF	--	--	REF	--	--
Yes	**0.40(0.19)**	**0.03**	**1.49(1.03-2.15)**	-0.10(0.22)	0.64	0.90(0.58-1.40)	-0.03 (0.20)	0.89	0.97(0.66-1.43)	0.26(0.22)	0.24	1.30(0.84-1.01)
Age at Baseline	**-0.02(0.01)**	**0.03**	**0.98(0.97-1.00)**	**0.04(0.01)**	**0.01**	**1.04(1.03-1.06)**	**0.02 (0.01)**	**0.05**	**1.02(1.00-1.04)**	-0.01(0.01)	0.21	0.99(0.97-1.01)

Note. Coef=Coefficient; SE=Standard Error; OR = Odds Ratio; CI = Confidence Interval; Estimates in bold indicate p≤0.05.

Effects of Latent Class Membership on Outcomes When Controlling for Covariates

Two outcomes differed by latent trauma class at significant ($p \leq 0.05$) or approaching significant ($p \leq 0.06$) levels after adjusting for all covariates (See Table 8). First, homelessness differed significantly by trauma class ($p<0.001$). Second, being in jail differed by trauma class, as well, but the difference was only approaching significance ($p = 0.06$). Results regarding this outcome should be interpreted with caution.

For the first outcome, homelessness, participants belonging to the *Lifetime Interpersonal Polyvictimization* class had the highest proportion of those experiencing homelessness during the post-release period (Wald test: $\chi^2=15.84$, $p <0.001$). While 22% of those in the *Low Exposure* class experienced homelessness, 38% of those in the *Lifetime Interpersonal Polyvictimization* class did (difference = 0.16, $p<0.01$). This difference was even greater when compared to those in the *Lifetime Environmental Exposures* class. Only 16% of those in the *Lifetime Environmental Exposures* class experienced homelessness, a difference of 22% ($p < 0.01$).

While not quite statistically significant, the results for the outcome of re-incarceration are presented, in part, because they help provide context for the relatively low proportion of those in the *Lifetime Environmental Exposures* class experiencing homelessness. This class had the highest proportion of those in jail at the end of the study period (Wald test: $\chi^2=5.67$, $p = 0.06$). Close to one-third of the *Lifetime Environmental Exposures* class was in jail. The *Low Exposure* class and the *Lifetime Interpersonal Polyvictimization* class were in jail at close to the same rate, 19% and 18%, respectively, a difference of 12-13% when compared to the *Lifetime Environmental Exposures* class ($p = 0.06$ and $p = 0.02$, respectively).

Table 3.8. Prevalence of Distal Outcomes across Three Latent Classes of Trauma Exposures in Adjusted Analysis

	Proportion (SE)	Wald Test*	Significant Pairwise Comparisons	Difference in Proportions (SE)	p
Arrested at Some Point Post-Release		χ^2=4.36 p<0.11	**		
Overall sample	0.42 (NA)				
Low Exposure	0.35 (0.04)				
Lifetime Interpersonal Polyvict.	0.40 (0.04)				
Lifetime Environ. Exposures	0.50 (0.05)				
Homeless at Some Point Post-Release		**χ^2=16.84 p<0.001**	Lifetime Interpersonal Polyvict. vs. Lifetime Environ. Exposures	**0.22 (0.06)**	**<0.01**
Overall sample	0.25 (NA)		Lifetime Interpersonal Polyvict. vs. Low Exposure	**0.16 (0.05)**	**<0.01**
Low Exposure	0.22 (0.04)		Lifetime Environ. Exposures vs. Low Exposure	-0.06 (0.06)	0.28
Lifetime Interpersonal Polyvict.	0.38 (0.04)				
Lifetime Environ. Exposures	0.16 (0.04)				
Unemployed at Last Interview		χ^2= 1.75 p<0.42	**		
Overall sample	0.35 (NA)				
Low Exposure	0.31 (0.04)				
Lifetime Interpersonal Polyvict.	0.36 (0.04)				
Lifetime Environ. Exposures	0.40 (0.05)				
In Jail at Last Interview		***χ^2=5.67 p = 0.06***	Lifetime Interpersonal Polyvict. vs. Lifetime Environ. Exposures	***-0.13 (0.06)***	***0.02***
Overall sample	0.23 (NA)		Lifetime Interpersonal Polyvict. vs. Low Exposure	-0.02 (0.05)	0.76
Low Exposure	0.19 (0.04)		Lifetime Environ. Exposures vs. Low Exposure	***0.12 (0.06)***	***0.06***
Lifetime Interpersonal Polyvict.	0.18 (0.03)				
Lifetime Environ. Exposures	0.31 (0.04)				

Note. All models are adjusted for direct effects of gender, race/ethnicity, age, education, marital status, prior employment status, service use after prison, lifetime PTSD, and lifetime SUD. *Wald test has three degrees of freedom. **Pairwise comparisons not performed due to non-significant Wald test. SE = Standard Error. NA = Not Applicable. Polyvict. = Polyvictimization. Environ = Environmental. Estimates in bold indicate p≤0.05. Estimates in bold italics indicate approaching statistical significance at p≤0.06.

3.4 Discussion

This study had three main findings. First, the latent class model found in this study mirrored the latent class model found in Morrison (2022), lending credibility to the underlying class structure. Second, the latent classes maintained similar trauma exposure patterns across all time periods. That is, those with low exposures in childhood continued to have low exposures in adulthood and into the reentry period. Those with high trauma exposures in childhood continued to have high exposures in adulthood and into the reentry period. This is consistent with other trauma research, in particular polyvictimization research, which has found that trauma exposure acts as a risk factor for later trauma exposure (Lussier et al., 2018). Third, each of the two high exposure classes, *Lifetime Interpersonal Polyvictimization* and *Lifetime Environmental Exposures*, was associated with risk for a different adverse reentry outcome, supporting a tailored approach to intervention design.

Comparing Results to Prior LCA of 5-Key RCT Participants

This study used LCA to explore the role of trauma in the lives of individuals leaving prison and attempting to reenter society. The sample used in this study was a subsample of the 5-Key RCT and of the sample used in the previous paper, "Trauma and Incarceration: A Latent Class Analysis of Lifetime Trauma Exposures for Individuals in Prison" (Morrison, 2022). Both LCA's found very similar 3-class models in which each class comprised approximately one-third of the sample. Each class in both studies had similar probabilities for trauma types and timing. In both, one class was characterized by relatively low trauma exposures across the life course. A second class was characterized by high levels of exposure to multiple interpersonal victimizations (known in the research and practice literature as polyvictimization) across the life course (Finkelhor et al., 2011). A third class was characterized by relatively low levels of

interpersonal victimization but high levels of environmental dangers, such as witnessing violence to others and experiencing the death of loved ones. In both studies, gender, employment, and lifetime PTSD were predictive of class membership in similar ways. Race/ethnicity and education were predictive in the first study but not the second while age was predictive in the second but not the first. This may be due to differences in sample sizes or to differences in sample characteristics. Additional studies would help clarify this. Nonetheless, both studies found very similar trauma patterns with very similar predictors, suggesting the underlying latent class structure is reflecting true subgroupings.

Comparing Childhood and Adulthood Trauma to Reentry Trauma

In this study, four trauma indicators from the reentry period were added to the LCA. These indicators measured the prevalence of trauma exposure during a 15-month period following release from prison. This is an area of research that is understudied despite being a high risk time-period (Binswanger et al., 2007; M Morrison et al., 2019; Carrie Pettus-Davis, 2014). This study found that for those in the *Low Exposure* class, trauma exposures remained low after release. For those in the two high trauma classes, trauma remained high after release, with approximately half witnessing violence, a third experiencing dangerous environmental exposures, and more than one in 10 being the victims of physical violence in just over a one-year period.

Tailoring Interventions to Trauma Class

This study added outcome variables to the LCA model, looking at four adverse outcomes commonly used to measure the reentry period. Membership in the *Lifetime Interpersonal Polyvictimization* class was associated with an increased likelihood of homelessness compared to the other classes. Nearly 40% of this class indicated being homeless at some point in the 15

months following release. Similarly, membership in the *Lifetime Environmental Exposures* class was associated with an increased likelihood of being re-incarcerated. Close to one-third of this class was in jail by the end of the study period.

Assessment for interpersonal polyvictimization would be an important step toward identifying individuals in need of tailored housing and mental health services. For members of the *Lifetime Interpersonal Polyvictimization* class, trauma-related symptoms may be interfering with their ability to navigate and maintain the personal and professional relationships necessary to securing housing during the reentry period. While individual trauma-specific interventions (e.g., psychotherapy) may be necessary, trauma-informed services would also be indicated. Individuals in this class may require, for example, single-occupant housing in order to support a sense of safety required for building emotion regulation and distress tolerance skills. The pressures of congregate living may undermine skill building in this area and increase risk for homelessness.

Those in the *Lifetime Environmental Exposures* class may be at risk for being overlooked in a trauma assessment if the focus is on interpersonal violence or a history of child maltreatment in the home. This is a class for whom trauma exposures have been in the form of loss of loved ones to violence and accidents and exposure to environmental toxins and hazards as well as property crime. It is important that these types of exposures be incorporated into the assessment process. This would include assessment of current living conditions with particular attention to needs in the areas of financial and material resources and advocacy in employment, housing, medical, and legal contexts. Because PTSD is elevated in this group as well, mental health services focused on addressing trauma remain important but for this group, the building of

material resources may be most protective. In other words, poverty interventions may be the primary form of intervention for this class.

Findings on the specific nature of trauma exposure for the two high-trauma classes is important to the development of both trauma-specific and trauma-informed interventions for this population. Research on trauma intervention approaches has found that having basic safety needs met is essential to recovery (Herman, 1992; Van der Kolk, 2014; Zaleski et al., 2016). This research is what has led to the current movement for trauma informed service systems (Miller & Najavits, 2012). In this study, participants in the two high trauma classes are unsafe and a focus on creating safety in their environments – through, for example, individual housing, poverty interventions - is needed in reentry service systems.

3.5 Limitations

Limitations in this study include those noted in "Trauma and Incarceration: A Latent Class Analysis of Lifetime Trauma Exposures for Individuals in Prison" (Morrison, 2022). These include, first, the difficulty in collecting reliable trauma histories due to the nature of trauma, memory, and retrospective studies as well as the challenge involved in using cross-sectional data to measure trauma over time. Second, the small proportions of female-identifying and non-binary participants made estimations of the role of gender unreliable. Third, sexual orientation was not considered also due to small sample size. As noted in Morrison (2022), gender and sexual orientation are important considerations in the study of trauma in prisons but were not addressed in this study.

This study had two additional limitations. First, while the data was drawn from an RCT with half of the participants assigned to a control group, it was not possible to identify the treatment and control group from the available data. The SACA was used as a rough measure of

those who engaged in services and those who did not. Second, parole supervision is an important factor to consider given that 22% of those in prison nationally are there as a result of parole violations. However, because one of the states in this study (Florida) abolished parole in 1983, this covariate was not included in the study as it would not apply to all of the participants (Griset, 1996). A future study using only states with parole would be important for understanding the role of supervision in post-release outcomes. It should be noted that approximately half of the study sample was under supervision. Pearson chi-square analyses showed no statistically significant differences between those who were under supervision and those who were not for any outcome.

3.6 Conclusion

Findings from this study are consistent with other research on trauma among incarcerated individuals: high levels of trauma exposure are the norm for this population (Blitz et al., 2008; Caravaca Sánchez et al., 2017; Morrison et al., 2019; Morrison, 2022; Carrie Pettus-Davis, 2014; Trestman et al., 2007; Wolff et al., 2007, 2014; Wolff & Shi, 2012). This study makes a particularly important contribution to research on trauma among men who experience incarceration as the majority of research on trauma for incarcerated populations is focused on women (Miller & Najavits, 2012; Morrison et al., 2019; Carrie Pettus-Davis, 2014). It is hoped that the findings in this study help advance our understanding of the complex role of violence in the lives of men in the criminal justice system and of the complex service needs of this population. It is also hoped that it adds to our knowledge about the nature of trauma exposure during the reentry period and can offer guidance in the development of tailored, trauma-informed and trauma-specific reentry intervention approaches.

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Chapter 4: The Mass Incarceration Trauma Framework: A Conceptual Frame for Understanding Trauma Among Individuals Who Experience Incarceration

Abstract

The Mass Incarceration Trauma (MIT) framework is a conceptual framework for understanding the role of trauma in the lives of individuals who experience incarceration in the U.S. This population faces poverty, violence, and discrimination across the lifespan. The MIT framework is guided by an ecological systems perspective, a foundational theoretical approach in social work and public health, and recognizes that effective assessment and intervention requires an understanding of the complex contexts in which individuals live. The MIT framework presents the cumulative trauma exposures commonly faced by this population, before, during, and after incarceration, at the individual, social, environmental, and historical levels. Because traumatic stress undermines health and daily functioning, it is essential that interventions for this population address both the ongoing risk for trauma exposure and the consequences of multiple, repeated past exposures across ecological levels.

4.1 Introduction

The purpose of this paper is to provide a conceptual framework for understanding the role of trauma in the lives of individuals who experience incarceration. This framework addresses a theoretical gap concerning service needs for this population. The conceptual model, called the Mass Incarceration Trauma (MIT) framework, proposes that trauma is a defining but overlooked characteristic of incarcerated populations in the U.S. The MIT framework describes the relationship between the two main concepts, trauma and incarceration, and situates them in time. It is intended to be a guide for identifying and assessing trauma and for tailoring interventions specifically for this population in the 21st century.

This paper begins with background information on the American criminal justice system and sets forth reasons for developing a trauma framework for individuals who experience incarceration in the U.S. Brief summaries of three relevant trauma theories are then presented followed by a review of the empirical literature linking trauma and incarceration. The MIT framework is then presented with a discussion of implications of the framework for intervention research and development.

4.2 Background

While the criminal justice system is meant to be guided by principles of equal protection under the law, studies continue to show that it is a system in which race, economic class, and geographic location shape outcomes (e.g., Acevedo et al. 2019; Beck and Blumstein 2018; Kovera 2019). Those who experience incarceration are among the most vulnerable demographic groups and are subjected to excessively punitive policies and practices within courts and correctional facilities (Mears et al., 2021; Jeremy Travis et al., 2014). Upon release, they face stigma and social, economic, and political exclusion, often for the remainder of their lives

(Western et al., 2015). Many of those in this system also belong to racial groups that historically have been the explicit target for abuse by the criminal justice system under slavery, Black Codes, convict leasing, Jim Crow, and the War on Drugs (Blackmon, 2009; Mancini, 1996; Mauer & Coyle, 2013).

It is to be hoped that a new and fundamental focus on the poverty, contexts of violence, and lifetime disadvantages experienced by those who cycle through prisons in the U.S. might reframe the question of how our society should prevent and respond to crime as well as respond to those swept into the criminal justice system. Absent attention to the empirically demonstrable traumatization of those involved in the criminal justice system, it is hard to envision substantial societal progress in this area. A focus on prior and ongoing trauma among incarcerated individuals does not prevent practitioners and policymakers from addressing maladaptive patterns of behavior individuals might present with. But any practice or policy which addresses incarceration and does not acknowledge the centrality of trauma and social contexts fueling trauma will necessarily be incomplete.

4.3 Trauma Theories

In the mental health field, the term "trauma" is often used as short-hand for two connected phenomena. First, it can refer to a traumatic event or exposure. A traumatic event or exposure is the precondition for the second meaning the term often carries, which is the responses or symptoms an individual experiences afterward. To gauge trauma, researchers and clinicians use a variety of instruments to measure both the exposures and the symptoms. These range from the more formal (e.g., diagnostic scales developed from criteria in the Diagnostic and Statistical Manual of Mental Disorders (DSM)) (e.g., Geier et al., 2020; Hooper et al., 2011) to the less formal (e.g., the popular "Adverse Childhood Experiences" or ACE's scale) (Nagy et al.,

2019). As described by trauma researcher Judith Herman, traumatic events are those that "overwhelm the ordinary human adaptations to life" (Herman, 1992, p.33). They are experiences that take us outside our capacity to cope. Events are generally considered traumatic if they pose a threat to a person's physical or psychological safety. The person's response to such an event tends to unfold over time and can lead to one or more of the following symptoms: hyper-arousal (such as being easily startled or having difficulty sleeping), intrusion (such as having flashbacks), and constriction (such as emotional numbing or dissociation) (Courtois & Ford, 2009). These symptoms are employed as formal criteria for a disorder, such as PTSD, if they undermine the individual's ability to function in daily life (Zaleski et al., 2016). Three areas of trauma research and theory that apply to those who experience incarceration are complex trauma, polyvictimization, and historical trauma.

Complex Trauma

Complex trauma occurs when violence, threat, or victimization are experienced repeatedly over time *under conditions in which escape is not possible*. Examples include a child experiencing chronic abuse by a caregiver or a soldier tortured as a prisoner of war (Herman, 1992). The after effects of these kinds of exposures are observed as a syndrome of reactions that lasts many years and includes pervasive disruptions to interpersonal functioning, physiological dysregulation, and damage to one's ability to make meaning of life (Van Der Kolk et al., 2005).

Polyvictimization

Polyvictimization is a term used to describe experiences of multiple *types* of trauma over time (Finkelhor et al., 2007). The polyvictimization literature emphasizes the role that context or environment play in placing some individuals at higher risk (Layne et al., 2010). Finkelhor and colleagues (2009), in their study of children who experience polyvictimization (such as a child

who experiences both physical and sexual abuse by a caregiver), found three pathways associated with polyvictimization risk: individual vulnerabilities, dangerous and/or overwhelmed families, and dangerous environments (Finkelhor et al., 2009). Researchers have found that experiencing multiple types of victimization is associated with more severe mental health outcomes than either single incident or single type (even when repeated) victimization (Lussier et al., 2018).

Historical Trauma

Trauma is, by its nature, about history. Traumatic symptoms are often conceptualized as past events intruding on the present in an individual's consciousness (Herman, 1992). Recently, historical events or conditions within a society have been increasingly recognized as a potential source of traumatic exposure that can intensify and complicate individual trauma (Mohatt et al., 2014; Sotero, 2006). Public health researchers have found that populations exposed to mass traumas in the past, such as genocides, have elevated rates of disease for multiple generations (Mohatt et al., 2014). Historical trauma is a relatively new concept in both mental health and public health fields and there is limited quantitative research as well as variations in theoretical conceptualization in this area (Danieli, 2007). While some research has emphasized the individual-level mechanisms, such as how parenting might be involved in intergenerational transmission of trauma, others are concerned with larger social contexts that result from mass trauma and that continue to shape health disparities, such as racial residential segregation (Sotero, 2006). These traumatic social contexts are also associated with societies that have not engaged in processes of truth and reconciliation following a mass trauma (Kirmayer et al., 2014). The effects of mass traumatic exposures are believed to unfold over generations, either through family relationships that are shaped or disrupted by the original mass trauma (e.g., parental

PTSD, family separation, epigenetics) or through ongoing societal and political problems resulting from the original mass trauma (e.g., discrimination, poverty) (Danieli, 2007; Yehuda & Lehrner, 2018).

4.4 Connecting Trauma and Incarceration

The research literature has established that the majority of individuals who experience incarceration also experience repeated trauma exposures across the life course (Morrison et al. 2019; Morrison, 2022a, 2022b; Western 2015; Wolff & Shi 2012; Pettus-Davis 2014). The research has also established that individuals who experience incarceration typically come from chaotic and dangerous homes and/or neighborhoods, enter dangerous correctional facilities, and are released to economically-stressed, resource-poor areas (Miller, 2017; Travis, 2005; Western et al., 2015). In other words, each life stage is a potential pathway to trauma.

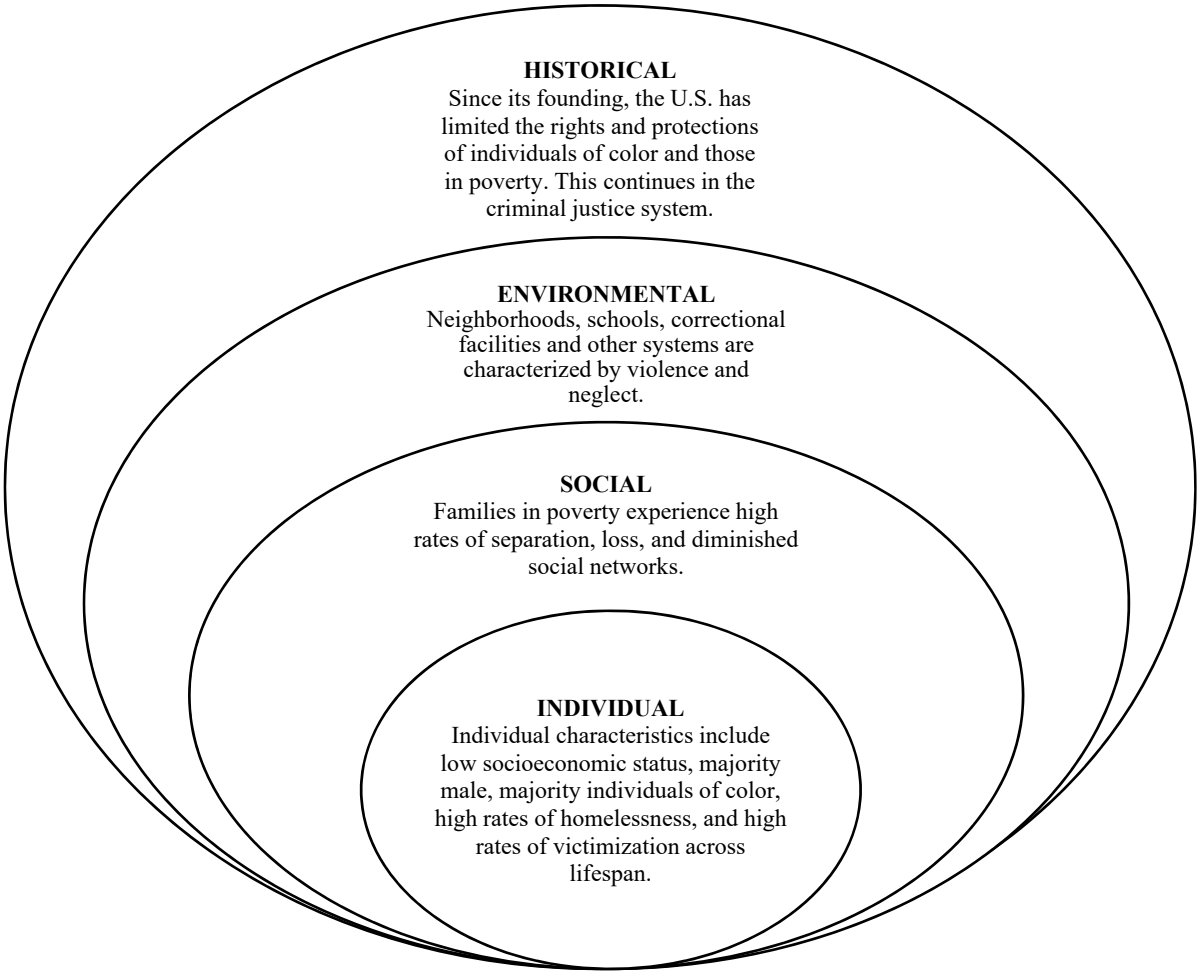
The literature on complex trauma, polyvictimization, and historical trauma each help illuminate the experiences and mental health needs of this population. First, a key feature of complex trauma is that it is trauma experienced *in conditions of captivity* (Herman, 1992). Captivity is the defining feature of incarceration increasing the likelihood for complex traumatization and subsequent symptoms. Similarly, polyvictimization research has focused on children and the elderly, in part, due to their *status as dependents*. Children and the elderly are similar to incarcerated persons in this regard – they are populations in states of dependence on those who may also be inflicting harm on them (Finkelhor et al., 2007). Like children and the elderly, incarcerated individuals have unique vulnerabilities and live in high-risk contexts. Lastly, it is impossible to fully conceptualize either trauma or incarceration in the U.S. without an awareness of the history of racial injustice and violence that has shaped the criminal justice system and the socioeconomic landscape of the country (Mauer & Coyle, 2013; Stevenson, 2017,

2019). Captivity and dependency were violently imposed for generations on the ancestors of African Americans through the mechanisms of slavery and racially biased laws and social practices. A national process of truth and reconciliation did not follow the end of slavery and overt racial bias in the law and instead widespread use of captivity and dependence in the criminal justice system emerged in the form of mass incarceration (Stevenson, 2017).

4.5 Mass Incarceration Trauma (MIT) Framework

The MIT framework uses an ecological systems perspective as its basis (Bronfenbrenner, 1992). Figure 1 presents an adaptation of Bronfenbrenner's ecological systems to a 21st century incarcerated population in the U.S. An ecological systems perspective is a standard contextualizing framework for social work and public health intervention and requires that any understanding of an individual include an assessment of the multiple, overlapping contexts or systems in which they live (Derksen, 2010; Eriksson et al., 2018; Krug et al., 2002). The MIT framework is presented in Table 1 as a grid, with each ecological system (individual, social, environmental, and historical) intersecting with each time period in an incarcerated person's life (before, during, and after incarceration). Guided by the empirical literature, each intersection or box within the grid identifies specific types of trauma exposures commonly faced by this population at each time period and within each ecological system. The MIT framework presents a model of cumulative trauma exposure, with each box identifying both an exposure and a risk factor for subsequent exposures.

Figure 4.1. The ecology of individuals who experience incarceration



Adapted from Bronfenbrenner, 1992

Individual

Each level of the MIT framework corresponds to a different ecological level. The i ndividual level is meant to capture trauma directed at the person, with particular attention paid to individual vulnerabilities or risk factors. Brief descriptions of the exposures from the empirical literature are presented for each time period below as well as summarized in Table 1.

Before: Rates of childhood maltreatment are high for individuals who experience incarceration (Wolff & Shi, 2012). In a study using a nationally representative sample (N=1,516) of incarcerated individuals, over 50% reported childhood physical abuse and 50% reported childhood neglect (Morrison, 2022a). Despite being a primarily male sample (90%), over 15% reported childhood sexual abuse as well (Morrison, 2022a). Similar findings were found in another study using a nationally representative sample of individuals in prison (N = 3,986), with 45% of the sample reporting physical trauma in childhood, 11% reporting childhood sexual abuse, and 10% reporting both physical and sexual abuse in childhood (Wolff et al., 2011).

During: Rates of victimization experienced while in prison are also high (Cloud, 2014). Violence and injuries are among the most common health problems, with some estimates indicating 20% of individuals in state prisons experience sexual victimization and 35% percent experience physical victimization (Wolff, et al, 2006; Wolff, et al., 2007). On any given day, an estimated 84,000 individuals are held in solitary confinement in the U.S. despite two centuries of research demonstrating the severe, long-term psychological harm caused by being held in these conditions (Grassian, 2006; Haney, 2018). Mechanical restraints, chemical agents, denial of food, strip searches and cavity searches are all standard procedures in correctional facilities for enforcing compliance and for punishment (Bersot & Arrigo, 2011; Camplin, 2016; Cosey, 2013).

After: Rates of victimization after exiting prison are also high (Binswanger et al., 2007; Cloud, 2014). During the first year following release, individuals face high risk for homelessness, homicide, suicide, drug overdose, heart disease, and return to incarceration (Miller & Stuart, 2017). In a nationally representative sample of individuals recently released from prison (N=616), nearly 10% experienced physical victimization and 36% witnessed violence against others in the 15 months following release (Morrison, 2022b). A quarter of the sample experienced homelessness during that time (Morrison, 2022b). For those who experienced polyvictimization starting in childhood (n=190, 31%), close to 40% experienced homelessness, demonstrating compounding of trauma risk over time (Morrison, 2022b).

Social

In the MIT framework, social-level trauma exposures are those experienced in the family and interpersonal context. In ecological systems theory this is also referred to as the micro or relational level (Bronfenbrenner, 1992; Krug et al., 2002). These experiences are typically part of the family histories of individuals who experience incarceration and involve severe stressors within the family and social network, often resulting in separation and traumatic loss. Descriptions of each type of exposure during each time period are presented below.

Before: The majority of individuals who experience incarceration grow up in poverty (Looney & Turner, 2018). Families experiencing poverty have high rates of family violence (Benson et al., 2004) and single parenting (Wimer et al., 2021). Children in poverty are also more likely than other children to experience family separation through foster care (Drake & Pandey, 1996; Putnam-Hornstein & Needell, 2011) and parental incarceration (Wildeman et al., 2019). They are more likely to experience more punitive parenting styles (McLeod & Shanahan, 1993; Peverill et al., 2021), less parental supervision and involvement (Costello et al., 2001; G.

W. Evans & Kim, 2013), and to experience parental rejection in adolescence (Devenish et al., 2017). While only 15% of the U.S. population, African Americans make up 40% of the prison population (Carson et al., 2020). African American experience high rates of loss of family and friends to homicide (Heron, 2019). One study found that African American men in Baltimore lost, on average, three loved ones to homicide by early adulthood (Smith, 2015).

During: Individuals in prison are forcibly separated from their families and communities and experience isolation and traumatic loss (Folk et al., 2019; McKay et al., 2018). While the majority of individuals in prison are from urban areas, the majority of state prisons are located in remote, rural areas, limiting access to visits from families and friends (Lawrence & Travis, 2004). Phone access and visitation are restricted and denial of phone access and visitation are a standard form of punishment in correctional facilities (Gonzalez, 2021).

After: For incarcerated individuals, especially those serving long sentences, family relationships and social networks have often been diminished or lost by the time of release from prison (Harding et al., 2014). Social relationships are also strained or lost during the reentry period due to the high level of dependence formerly incarcerated individuals experience, having been released with typically no independent housing, employment, or transportation as well as having become, to some degree, institutionalized (Haney, 2002; Keene et al., 2018).

Environmental

In the MIT framework, environmental-level trauma exposures are those experienced in the context of larger social institutions as well as the physical environment. These exposures are associated with the characteristics of the environment and institutions that shape the daily life of a majority of individuals who experience incarceration. Environmental exposures often involve witnessing or being proximate to chronic violence and danger. In ecological systems theory, this

level may be referred to as the exosystem or the community level (Bronfenbrenner, 1992; Krug et al., 2002). Types of environmental-level exposures common in the lives of individuals who experience incarceration are presented below for each time period.

Before: Those who experience incarceration come largely from segregated, impoverished neighborhoods in the U.S. (Sampson & Loeffler, 2010). Poor neighborhoods in the U.S. are characterized by decaying infrastructure, crowded and low-quality housing, proximity to toxic waste dumps and other environmental hazards, high lead levels, high levels of air pollution, violent crime (Graif & Matthews, 2017), and high rates of pedestrian and car accidents (Evans, 2004). Witnessing violence is the most common trauma exposure reported by individuals who experience incarceration, with 60% reporting this exposure in childhood (Morrison, 2022b).

During: Due to the exponential growth in the prison population since the 1970's, most correctional facilities are over-crowded (Simpson & Butler, 2020). Prison crowding is associated with not only poor living conditions but more punitive correctional management strategies (Cloud, 2014; Specter, 2006). Mechanical restraints, chemical agents, stun devices, SWAT team cell extractions, full-body restraint beds and chairs, and solitary confinement are more commonly used in crowded conditions, particularly with individuals with mental illness (Fellner, 2015; Specter, 2006). In a nationally representative sample of incarcerated individuals (N=1516), 80% reported living in dangerous environments and close to 90% reported witnessing violence during adulthood (Morrison, 2022a).

After: Individuals released from prison typically return to the impoverished communities and environments they lived in prior to their arrest (Drake et al., 2021; Morenoff & Harding, 2014). They return, however, with diminished resources, lacking the financial ability, for example, to secure housing. This is compounded by the absence of a recent housing or rental

history and discrimination faced in the housing application process due to having a criminal record (Evans et al., 2019). Formerly incarcerated individuals are likely to be homeless (Morrison, 2022b), live in shelters (Wolff & Draine, 2004), be victims of violent crime (Binswanger et al., 2007), be unemployed or have employment in dangerous work conditions (Zatz, 2020; Morrison, 2022b) and to have reduced life spans (Nosrati et al., 2018; Wildeman & Wang, 2017).

Historical

In the MIT framework, historical-level exposures occur in contexts largely shaped by the history of racial and economic injustice in the U.S. In ecological systems theory, this level is referred to as the macro level or societal context (Bronfenbrenner, 1992; Krug et al., 2002). As noted earlier, the transmission of trauma at the historical level is theorized to occur either through intergenerational mechanisms (e.g., children exposed to their parents symptoms of trauma) or through ongoing social and political problems (e.g., discrimination, economic stratification). In the MIT framework, the focus is on the discriminatory practices that have influenced and continue to shape the current criminal justice system. These practices may directly cause trauma or may create conditions that compound or complicate past trauma. Historical trauma exposures at each time period are described below.

Before: The neighborhoods where rates of incarceration are the highest are those created by 20th century American policies aimed at limiting the rights of African Americans and undermining the progress made during the Civil Rights Movement (Wacquant, 2002). Racially restrictive zoning ordinances during the first half of the 20th century and redlining during the second were among the discriminatory policies and practices leading to residential segregation in the U.S. (Shapiro, Meschede, and Osoro, 2013). The decline of the manufacturing industry in the

1970's and 80's increased poverty in African American urban neighborhoods (Travis, Western, & Redburn, 2014). The policy approaches aimed at addressing the range of economic and social issues arising in these contexts were primarily punitive, with increased use of police interventions and decreased use of social welfare interventions during the War on Drugs (Waquant, 2010). Among the results of these polices, arrests for drug possession alone tripled, from 500,000 in 1982 to 1.5 million in 2007 (BJS, 2008), becoming the most common form of arrest in the U.S. (Lynch, 2012). The large-scale removal of African American men from poor communities through incarceration continues to disrupt families, decrease informal social control, and increase unemployment, single parenthood, and poverty (Sampson & Loeffler, 2010).

During: Mass incarceration has resulted not only from more individuals being sent to prison but from individuals staying longer in prison (Mauer, 2015). Criminal justice policies in the 1970's increased the use of incarceration and lengthened prisons sentences for drug-related offenses (Mauer, 2015). As a result, the number of individuals sentenced to 50 or more years has quadrupled (Nellis, 2017). This lengthening of sentences has had disproportionate impact on African American men who make up half of those serving life and virtual life sentences (Nellis, 2017). Longer sentences has meant more individuals aging in prison (Maschi et al., 2021). Currently, about 8% of individuals in state prison are age 55 or older (Maschi & Kaye, 2019). Aging in prison is associated with increased risk for victimization and disability (Wildeman, 2016). For each year served in prison, life expectancy is estimated to decline by 2 years post-release (Patterson, 2013).

American correctional policies and practices continue to be driven by a philosophy of "suppression and isolation" (Specter, 2006, p. 125) that originated under slavery and convict

leasing (Stevenson, 2019). Individuals in prison are deliberately subjected to pain as punishment (Haney, 2007). Strategies and implements used in correctional facilities include chains, shackles, pens, cages, isolation cells, and forced labor, each of which were strategies used to punish runaway enslaved persons and were standard – and often fatal - practices used during the early years of American corrections, in a system known as convict leasing (Blackmon, 2009; Mancini, 1996; Stevenson, 2019; Taylor, 2011).

After: Government policies in the first half of the 20th century limited the rights and protections of African Americans based on race (Williams, 2013). Felony records now limit many of the same rights and protections, disproportionately of people of color (Alexander, 2020). After release from prison, individuals have criminal records that place limits on where they can live (Drake et al., 2021; D. N. Evans et al., 2021), work (Larson et al., 2022), and go to school (Stewart & Uggen, 2020). In many states, a felony excludes individuals from voting or serving on juries (Uggen & Stewart, 2015). In Florida, for example, 10% of the adult population has lost the right to vote and serve on juries due to a criminal record (Uggen et al., 2016). The rate is twice that for African Americans in Florida (Uggen et al., 2016). Thus, while government policies no longer explicitly support race-based discrimination regarding housing, employment, education, and civil rights, criminal justice policies have continued these policies for a disproportionately non-White population. Individuals released from prison are concentrated in segregated areas that have experienced decades of government neglect (Sampson & Loeffler, 2010) where they are highly vulnerable to discrimination and violence (Uggen & Stewart, 2015; Western, 2015), lack legal protections (Pinard, 2010), and are likely to experience intergenerational poverty and the multitude of risks associated with it (Manduca & Sampson, 2019).

Table 1. The MIT Framework: Types of trauma exposures common in the lives of incarcerated individuals, by time period and ecological system

Time Periods Relative to Incarceration				
Ecological Systems		**Before**	**During**	**After**
	Individual	Childhood maltreatment, witnessing violence, and crime victimization	Mechanical and chemical restraints, solitary confinement, use of force, exposure to violence (direct and witnessed), denial of food, strip searches	Homelessness, witnessing violence, and crime victimization
	Social	Family poverty, loss of family and friends to homicide	Forced separation from family, loss of family role	Loss of social network due to extended absence, interpersonal challenges created by institutionalization, and strain created by economic dependence
	Environmental	Environmental pollutants and hazards, low-quality housing, under-resourced schools, and decaying physical infrastructure	Exposure to dangerous and crowded correctional facilities, adjudication by legal system in which race and economic class shape outcomes	Exposure to low quality, insecure housing (e.g., homeless shelters, halfway houses) and scarcity of resources in same neighborhoods of concentrated disadvantage.
	Historical	Neighborhoods of concentrated disadvantage shaped by history of racially and economically discriminatory policies	U.S. correctional practices developed under slavery to inflict pain	Denial of rights historically denied to individuals of color, intergenerational poverty in neighborhoods of concentrated disadvantage

4.6 Recommendations for Intervention

The MIT framework is intended primarily to inform reentry intervention services. It is intended to provide context for assessment and intervention design when serving individuals recently released from incarceration. While not meant to guide prevention services, it is nonetheless hoped that the MIT framework further documents the need for investment in prevention strategies, including reducing the American over-reliance on incarceration and reducing the traumatic elements of American incarceration itself. Many reentry service agencies already employ social work and public health approaches making the MIT framework consistent with many service agency structures, missions, and values. It is hoped that it might be used for adapting current intervention approaches as well as in the development of new approaches to serving individuals in the reentry process. Recommendations for interventions at each ecological level are presented below.

Individual: Incorporate Trauma Assessment and Treatment

Intervention research is needed to develop tailored trauma assessment tools and to adapt current trauma interventions for this population and for the settings in which they receive reentry services (Cloitre, 2015; Carrie Pettus-Davis, Renn, Lacasse, et al., 2019).

Social: Incorporate Material Support and Social Network Building

Providing material support and using asset building intervention strategies are essential and instrumental in helping individuals move out of poverty (Sherraden & Gilbert, 2016), a primary risk factor for both trauma exposure (Klest, 2012) and re-incarceration (Western et al., 2021).

Reentry service agencies are also positioned to help clients build meaningful interpersonal relationships in the community with individuals who can provide them with

employment and housing as well as financial, medical, mental health, and legal advocacy resources where they might otherwise experience discrimination. Community members are likely to be more open to building trusting relationships with individuals released from prison when provided with information about the excessively punitive and discriminatory nature of the criminal justice system and the need for reform (Rucker & Richeson, 2021). This is an important strategy for reducing stigma for this client population and for increasing access to basic social goods (Batastini et al., 2014).

Environmental: Adapt Current Reentry Service Agencies to a Trauma-Informed Model

There are numerous resources available for organizations interested in adopting a trauma-informed approach. For example, the Substance Abuse and Mental Health Services Administration (SAMHSA) has developed a technical assistance program to provide training to service providers in trauma-informed care at no cost to the service providers (Huang et al., 2014). This approach is an evidence-based set of strategies that is consistent with a recognition of the level of trauma present in the populations being served in the reentry process (Levenson, 2017). Agency-level changes have been found to produce positive results for both the clients served and the staff, increasing effectiveness of interventions and safety for both clients and staff within programs (Tebes et al., 2019). While trauma-informed approaches in prisons have yet to be studied, given the positive results found in juvenile detention settings, it is hoped that this strategy will begin to be considered in adult correctional settings as it is consistent with public safety goals (Miller & Najavits, 2012).

Historical: Adapt Current Reentry Service Agencies to Be History-Informed

An honest, historically-informed assessment of the criminal justice system and its targeting of low-income men of color is an important element of reentry service agencies'

development of their vision and mission statements. Staff training as well as educational outreach to the larger community regarding the current and historical realities of the criminal justice system support a more just, balanced, and effective approach to serving those leaving prison (Hetey & Eberhardt, 2018; J. Rucker et al., 2019). There is a tendency for reentry agencies to align themselves with the mission and values of correctional systems (Sipma-Dysico, 2013; Thompkins, 2010). A historically-informed approach to serving those leaving prison would be one that is aligned with public safety and social justice. This is not a position that is necessarily in conflict with the mission of corrections but it is distinct and it is supportive of the healing and protection of individuals who have been victimized in correctional contexts.

4.7 Conclusion

The trauma experienced by incarcerated individuals during the era of mass incarceration is a serious public health and social justice concern. The majority of the millions of individuals cycling through jails and prisons in the U.S. each year are low-income men of color. With exponential growth in the incarcerated population in the last 4 decades, correctional facilities have been unable to keep pace with demand for space and resources. Individuals enter these facilities with high rates of trauma and poor health and emerge with more trauma and even greater health burdens. The mass arrest of people convicted of crimes has not resulted in increased public safety (Mauer, 2015; Nellis, 2014). When individuals return to their communities, they arrive with greater levels of need and dependency and face a scarcity of resources. Not surprisingly, the majority are rearrested. This system of incarceration emerged from a long history in the U.S. of the criminal justice system functioning in ways that do more to maintain racial and economic hierarchies than improve public health and safety (Stevenson, 2017; Taylor, 2011).

While the current research literature is sparse on this population's experiences and service needs, this literature demonstrates two things. First, trauma is nearly universal across the life course for those who experience incarceration. Second, trauma is nearly universally unaddressed in this population. The majority of interventions for this population are guided by theory that defines this population as criminal and asserts that the primary mechanism for change is to reduce criminal thinking. The evidence demonstrating the biased nature of the criminal justice system and the dramatic demographic changes in the past 40 years reveal major flaws in this approach. The MIT framework proposes an alternative, evidence-based, social work and public health informed conceptualization of this population and recognizes that the challenges created by mass incarceration must be addressed through a systems-level approach.

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Chapter 5: Conclusion

This section will review the overall findings and implications from the three papers previously presented. Paper 1 described an LCA of the trauma histories of 1,500 individuals in state prisons. The goal of the analysis was to identify latent classes or subgroups within this nationally representative sample that were distinguished by unique patterns of trauma exposures over time. It found three distinct groups, each comprising about a third of the sample. The first class was characterized by low levels of exposure, the second by multiple environmental exposures, and the third by multiple interpersonal as well as environmental exposures. These patterns of exposure remained consistent over time. African American men had increased odds of membership within the high environmental exposures class. The majority of the sample fell within two classes with high, lifetime levels of trauma, before and during incarceration, both of which were associated with very high risk for PTSD.

Paper 2 described a second LCA using a subsample of the one used in Paper 1. This subsample included only those individuals who were released from prison during the study period and completed surveys during the 15-month post-release period. This LCA included an analysis of distal outcomes, looking at the relationships between membership within trauma subgroups and adverse reentry outcomes. A similar latent class structure was found, with about one third of the sample falling within each of three trauma classes – low exposure, environmental exposures, and interpersonal and environmental exposures. One outcome, homelessness, was associated with trauma class membership. While 25% of the sample experienced homelessness during the reentry period, 38% of those in the interpersonal and environmental exposures class did. A second outcome, returning to jail by the end of the study, was associated with trauma class membership but only at the 0.06 level, indicating the need to interpret this finding with

caution. While 22% of the overall sample was in jail at the end of the study, 31% of those in the environmental exposures class were.

Paper 3 incorporated the findings of Papers 1 and 2 into an original conceptual framework called the Mass Incarceration Trauma (MIT) framework. This paper is an update to the MIT framework which aims to elucidate the connections between trauma and mass incarceration. Guided by an ecological systems perspective, the framework presents types of trauma exposure experienced before, during, and after incarceration at each ecological level, specifically individual, social (interpersonal), environmental (institutional), and historical (cultural). The framework is intended to provide a more holistic view of the experiences of individuals who spend time in prison during an era of unprecedented levels of incarceration, in a country with a long and violent history of using the criminal justice system to maintain and shape racial and economic hierarchies. Findings from Papers 1 and 2 were consistent with and helped refine the framework.

The remainder of this section will look at the findings as a whole and integrate conclusions from the three papers. First, it discusses the public health and social justice concerns highlighted by this dissertation's findings. Second, it offers methodological recommendations for future research in this area. Lastly, it offers policy and practice recommendations at each ecological level.

5.1 Public Health and Social Justice Concerns

The trauma of incarcerated individuals during the era of mass incarceration is a serious public health and social justice concern. From a public health perspective, we have a very large and very vulnerable population with a range of severely negative health outcomes. Also from a public health perspective, this population is notable in that, during incarceration, it is available

for services, and the agencies holding them have an affirmative moral and practical responsibility to improve their very undesirable outcomes, both as individuals and in terms of their later interactions with society. From a social justice perspective, both the innately vulnerable nature of the incarcerated population and their tremendous overrepresentation of the poor and persons of color make this a population deserving of special attention. Despite these imperatives, the best available evidence indicates that current approaches to interventions for incarcerated populations have been unsuccessful in reducing mass incarceration (Pettus-Davis et al., 2020). As noted previously, about three out of four individuals are arrested within five years of release (Alper, Durose, & Markman, 2018).

This dissertation contextualizes this cycling through the criminal justice system within a set of trauma pathways, where the lives of those entering and leaving prison and jail are inundated with circumstances that overwhelm human capacities to cope. This reframing of the issue of incarceration into longitudinal pathways, beginning long before contact with the criminal justice system, and deeply rooted in a series of existing inequalities, is one of the contributions of this work. As these pathways are before, during, and after incarceration, a more complete picture of incarcerated individuals within their social context should emerge, with implications for a more productive societal response. The current scarcity of research literature reflects institutional failure to recognize the role of trauma in the maintenance of mass incarceration and undermines the ability of service systems to respond to trauma in this population. This dissertation aims to support an approach to policy, practice, and intervention research that both addresses individual-level trauma-related needs and addresses contextual factors that expose this population to high risk for further trauma and victimization.

5.2 Methodological Recommendations

The data source and the data analysis method used in this study each had a number of strengths that allowed for a deepening of our knowledge of the lives of individuals in this highly marginalized and largely unknown population. First, the data source was a multi-state, multi-prison study that gathered, among other things, detailed trauma histories from a large number of people in a relatively brief and efficient manner – and did so at multiple time points allowing for measures of trauma exposure over time and during key periods in participants' lives. The Trauma History Questionnaire and the Childhood Trauma Questionnaire are both easy to administer and well validated. The THQ was especially effective at capturing environmental exposures as opposed to only interpersonal ones, allowing for the inclusion of trauma exposures commonly experienced in contexts characterized by poverty. The primary drawback with the data source was that it did not allow for measurement of trauma specifically during incarceration which would provide important contributions to the literature. The data also did not contain the locations that individuals in the study came from and returned to. Geographic data (which can be merged with public county-level, zipcode or even tract-level data from sources such as the American Community Survey) could be helpful for further characterizing the contexts individuals live in before and after incarceration. For example, knowing the geographic location of an individual would allow the researcher to easily quantify such constructs as neighborhood poverty, income inequality, crime rate and availability of resources.

The data analysis approach, LCA, was effective at both simplifying complex, interacting mechanisms underlying trauma pathways in participants' lives and at identifying high risk groups. Both LCA studies in this dissertation provided results with high face validity, offering easy to describe and easy to comprehend subgroupings within this population. Moreover, the

differences between these subgroupings point clearly to different mental health service needs, service needs which could be identified through relatively straightforward individual assessment. While LCA is a complex statistical approach requiring methodological training and expertise, there are accessible, online training and consultation resources for researchers in the mental health field (e.g., CenterStat.org by Curran-Bauer Analytics). LCA is a powerful tool for identifying high risk groups and could be useful, as well, in assessing intervention effectiveness in future studies in this area.

5.3 Individual Level Recommendations

At the individual level, a range of evidence-based interventions exist to treat the consequences of complex trauma and improve coping skills. These include, for example, Dialectical Behavior Therapy (DBT) (Sweezy, 2011), Eye Movement Desensitization and Reprocessing (EMDR) (Chen et al., 2018), and sensorimotor psychotherapy (Ogden & Fisher, 2015), to name just a few. Research is needed to adapt these interventions to this population that takes into account the unique pathways to trauma, including environmental exposures associated with poverty, the incarceration experience itself, and experiences of racial discrimination at the hands of law enforcement.

Beyond these adaptations, there is substantial room for intervention studies sited at different points in time. For example, the findings of this dissertation indicate that while trauma exposures in childhood are common for this population, the exposures have two distinct etiologies and therefore require two distinct types of interventions. For individuals experiencing high levels of interpersonal polyvictimization, addressing child maltreatment in the home would be the primary prevention strategy. For individuals exposed to high levels of environmental trauma, individual-level intervention strategies would include anti-poverty, asset-building

programs. These preventative strategies could take the form of specific interventions designed to improve the family circumstances of young children, such as Nurse Home Visitation programs (Dodge et al., 2019) or could include any of a range of preventative programs aimed at improving the parent-child relationship as a means to reducing potential trauma for children (e.g., Webster-Stratton & Bywater, 2018).

Hopefully, as we move forward, we can develop bodies of literature looking at services at multiple points along the timeline, from pre-incarceration to incarceration to post-incarceration. Each of these timeframes will have different challenges (e.g. engagement) and substantial work needs to be done to adapt existing interventions to optimally serve this population at different points in their journeys.

5.4 Social Level Recommendations

This dissertation emphasizes and documents the ways in which individuals who experience incarceration also experience high levels of family poverty, family loss, and diminished social networks. Both poverty and social isolation predict a range of adverse outcomes and a range of policy and practice interventions have been developed to address both poverty and social isolation for other populations (Fakoya et al., 2020; Legrand et al., 2014; Sherraden & Gilbert, 2016).

Taking a step back, it appears clear that mass incarceration must be approached at this level. Given the astonishingly high rates of incarceration among certain geographies and demographics, it is beyond credibility that social context is not a (or the) key driving factor. As with many kinds of negative societal outcomes (e.g. child maltreatment, Pelton, 2015), it would appear that helping people often means improving community contexts.

Research is needed to adapt these interventions to populations experiencing incarceration. It is hoped that a fundamental re-orientation of service systems toward targeting the life long, pervasive resource deprivation in the lives of incarcerated populations could improve a wide range of outcomes - including trauma-related - for this population. Unfortunately, this is not always the kind of initiative that is easily supported in our society. Improving our knowledge of long-term gains made through generalized support of whole communities can be extremely hard to fund and evaluate, but such an approach also would seem to have extremely high potential.

5.5 Environmental Level Recommendations

The central finding of this dissertation – that 2/3 of the incarcerated population experience high levels of multiple types of trauma exposure across the life course – provides unequivocal evidence that trauma-informed approaches to intervention and services for this population are necessary. This, however, requires, again, a fundamental re-orientation to both services and this population, recognizing individuals who experience incarceration are at continuous high risk for victimization and struggling to manage severe trauma symptoms while navigating systems that tend to dehumanize them and often do not seek to act in their best interests.

There are two fundamentally different approaches possible when working with people living in under-resourced or otherwise potentially harmful environments. The first, and most desirable, is to improve the environments. As described above, this can be difficult to achieve from a practical or political perspective. While there have been some attempts to study or directly help in this way (e.g., Moving to Opportunity, scattered basic income projects, Chetty et al., 2016). A less desirable but potentially more achievable approach, at least in the short term, is

to provide services or create conditions which may buffer environmental risks. For example, interventions meant to reduce negative outcomes of exposure to violence could be beneficial, especially if offered early. Additionally, making service systems themselves more responsive to the trauma present within this population – through trauma-informed adaptation strategies such as the one proposed by SAMHSA – could reduce harm to this population. It is particularly hoped that progress could be made in this area within prison environments, progress which would require, at minimum, a drastic reduction in the numbers of individuals held within them.

5.6 Historical Level Recommendations

The content of history textbooks and the types of historical markers displayed in public are objects of intense political debate (O'Connell, 2020; Sleeter & Grant, 2018). While what we read and what statuary we might see while walking down the street might seem distant from considerations of mental health research, policy, and practice, these topics are highly divisive because they both shape and express dominant worldviews within a society (Grever & van der Vlies, 2017). Truthful representations of the history of racial and economic injustices in the U.S. have been found to have a moderating effect on criminal justice policy choices (Hetey & Eberhardt, 2018; J. Rucker et al., 2019). To this end, a general focus on truthfulness and acknowledgement of history, both at the national and local levels, could be beneficial.

Outside this larger context, the criminal justice system's disproportionate contact with men of color is rarely understood except through the consideration of individual choices and character flaws, thereby supporting racist assumptions as well as more punitive criminal justice policies and practices (Goff et al., 2008). This dissertation's findings support the development of education interventions aimed at the larger community and designed to contextualize the experiences of individuals in the criminal justice system as well as how the criminal justice

system came to take on its current form. Examples of this intervention approach include the Equal Justice Initiative's (EJI) Legacy Museum: From Slavery to Mass Incarceration. It is important to note that EJI is also a direct service provider to this population, offering pro bono legal representation and comprehensive, trauma-informed reentry services. What might happen if the public understanding of incarcerated individuals were expanded to be a more truthful appreciation of their entire life trajectories, and the extreme traumas that they have faced? Perhaps this would bring about an appreciation of the need to create a generally more supportive and less punitive context and environment, prior to, during and after incarcerations.

Current intervention approaches emphasize the individual while the findings of this dissertation and the MIT framework emphasize contextual factors. The MIT framework proposes an alternative, evidence-based, social-work informed conceptualization of this population and recognizes that much of the mental health burden carried by this population can only be addressed through a systems-level approach. It is proposed that this approach would both improve individual mental health outcomes and reduce re-arrest, thereby reducing mass incarceration. It is hoped that through a fundamental reconceptualization of this population from one that is criminal to one that faces enormous adversity, social work can lead the way in providing the research and interventions needed to end the social justice and public health crisis of mass incarceration.

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