



Prison and Violent Political Extremism in the United States

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Abstract

Objectives In the current study we consider the link between imprisonment and post-prison participation in violent political extremism. We examine three research questions: (1) whether spending time in prison increases the post-release risk of engaging in violent acts; (2) whether political extremists who were radicalized in prison are more likely to commit violent acts than political extremists radicalized elsewhere; and (3) whether individuals who were in prison and radicalized there were more likely to engage in post-prison violent extremism compared to individuals who were in prison and did not radicalize there.

Methods We perform a two-stage analysis where we first preprocess the data using a matching technique to approximate a fully blocked experimental design. Using the matched data, we then calculate the conditional odds ratio for engaging in violent extremism and estimate average treatment effects (ATE) of our outcomes of interest.

Results Our results show that the effects of imprisonment and prison radicalization increases post-prison violent extremism by 78–187% for the logistic regression analysis, and 24.6–48.53% for the ATE analysis. Both analyses show that when radicalization occurs in the context of prison, the criminogenic effect of imprisonment is doubled.

Conclusions In support of longstanding arguments that prison plays a major role in the identity and behavior of individuals after their release, we find consistent evidence that the post-prison use of politically motivated violence can be estimated in part by whether perpetrators spent time in prison and whether they were radicalized there.

Keywords Prison · Political extremism · Terrorism · Radicalization · Coarsened exact matching

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Introduction

In recent years, scholars and policy makers have expressed considerable disagreement about the impact of imprisonment on violent political extremism. Some researchers, particularly outside of the United States, have reported connections between time in prison and participation in violent extremism (Brandon 2009; Mulcahy et al. 2013; Neumann 2010; Cilluffo et al. 2006b).¹ Other researchers, particularly in the United States, are skeptical about a strong link between imprisonment and violent political extremism (Klein 2007; Jones 2014). For example, Useem and Clayton (2009:561) conclude that the probability of a terrorist plot being hatched in U.S. prisons is “modest,” owing especially to successes in prison administration to counter prison radicalization and low levels of interest among inmates.² Similarly, in a recent review of prison radicalization in the United States and five other countries, Jones (2014:78) concludes “to date, the radicalization and recruitment of inmates in U.S. prisons has not been a significant problem,” and more generally, that the radicalization of prisoners “is not necessarily a given outcome (p. 74).”

Hamm (2009:669) describes this apparent disagreement as “clashing viewpoints” and claims that the research literature is divided into two camps: a more “reassuring” camp, which concludes that there is no relationship between radical beliefs and terrorism in prisons and an “alarmist” position that sees prisons as incubators for terrorist ideology and post-release activism. Adjudicating between these viewpoints has been hampered by at least two limitations of current research. First, to date there has been little empirical data on political extremists. In the United States, the U.S. Federal Bureau of Prisons (BOP) has generally been reluctant to allow researcher access to individuals convicted of terrorism-related offenses (Shane 2011; Fairfield and Wallace 2016).³ Monahan (2017:529) reports that his attempts to interview terrorist prisoners and gain access to administrative records have been rebuffed by the BOP because such access “would pose security and workload concerns.” Because of this policy, most of the existing research on the effects of prison on political extremism in the United States is based on case studies (Hamm and Spaaj 2016) or small groups of individuals in state prison systems (Useem and Clayton 2009). While access to political extremists has been somewhat easier in other countries (e.g., Beckford et al. 2016; Khosrokhavar 2013; Silke 2014), still most of the research on political extremism among prisoners to date is based on qualitative case studies.

And second, most prior studies of political extremism and prison have examined radicalization within prison (Hamm 2008; Useem and Clayton 2009) or have been limited to individuals who have actually used violence for an extremist cause (Horgan 2005; Pape 2006; Sageman 2004). This strategy provides no evidence on the post-prison experiences of individuals who have served time in prison, nor does it consider those who may share similar ideological convictions but have not used violence in their pursuit. It could be for example, that even when there is little evidence that individuals were part of radical

¹ We adopt the FBI (2017) definition of violent extremism as “encouraging, condoning, justifying, or supporting the commission of a violent act to achieve political, ideological, religious, social, or economic goals”.

² We adopt the FBI definition of radicalization as “the process by which individuals come to believe their engagement in or facilitation of nonstate violence to achieve social and political change is necessary and justified” (Hunter and Heinke 2011).

³ A recent report in the *New York Times* claims that American prisons currently hold 443 convicted terrorists, but the reporters were unable to confirm the locations for two-thirds of the inmates identified (Fairfield and Wallace 2016).

extremist groups in prison, their prison experience may still be linked to radical violent extremism later in life. It could also be that individuals who develop radical political beliefs in prison nonetheless do not go on to commit violent acts. There have been attempts to address these limitations (Gartenstein-Ross and Grossman 2009; Kurzman 2017; Smith and Dampousse 2003), but thus far no research that we know of examines a large sample of radicalized individuals who either did or did not commit post-prison political violence.⁴

In general, we find the lack of empirical evidence for a connection between prison experiences and violent political extremism in the United States surprising because of the overwhelming evidence for an impact of prison on a wide variety of post-prison life experiences, including income (Western 2002), employment (Western et al. 2001), marriage and family (Sykes and Pettit 2014) and recidivism (Green and Winik 2010). The purpose of this paper is to explore the connection between imprisonment and violent extremism with a sample of 675 individuals who have committed ideologically motivated illegal acts or are closely associated with known terrorist organizations. Importantly, our analysis examines the post-prison behavior of these individuals and includes both individuals who have been publicly involved in non-violent (e.g., property destruction, tax evasion), as well as violent criminal acts (e.g., murder, assault). The data allow us to examine three related questions that to our knowledge have not been previously addressed with large samples: First, how does the frequency of violent political extremism post-prison compare for those who have served time in prison versus those who have not? Second, how does the post-prison frequency of violent political extremism for those who report being radicalized in prison compare to those who have never served time in prison? Finally, among those who have spent time in prison, how does the frequency of post-prison violent political extremism compare for those who report being radicalized in prison versus those who report being radicalized elsewhere?

The paper proceeds in five sections. First, we review relevant literature on prison culture and violence, especially as it relates to engaging in violent political extremism. Second, based on the review we provide three related hypotheses to explain how prison experience is related to participation in violent political behavior. Third, we describe the data and methods used to test the hypotheses, including discussions of how each of our independent, dependent, and control variables are measured and how we compensate for missing values in our dataset. Fourth, we discuss the results of our analyses. Finally, we conclude with the implications of the paper for advancing both theory and public policy on imprisonment for violent political extremism.

Prior Research and Hypotheses

The present study aims to fill a gap in the corrections and political extremism literature by exploring whether spending time in prison, as well as being exposed to prison-influenced radicalization, are associated with higher risks of adopting violent means in pursuit of ideological goals after prison. We first contrast the propensity for violent political extremism among those who spent time in prison and those who did not. We then compare violent behavior for those who never spent time in prison and those who

⁴ More generally, we know of no U.S. recidivism studies that follow people who have been radicalized in prison.

radicalized in prison. Finally, we focus only on those individuals who have been incarcerated, contrasting the propensity for violence among those who radicalized in prison and those who spent time in prison but radicalized elsewhere. In the next two sections we review relevant literature on the effects of incarceration on violence and on the adoption of extremist ideologies.

Prison Culture and Violence

Theory and prior research suggest that spending time in prison and being radicalized in this setting versus elsewhere should predict greater involvement in violent crime. In his classic ethnography on prison life, Clemmer (1940) discusses the isolation of newly admitted inmates and the tendency for them to be gradually socialized into prison culture. This socialization is essential for effective prison adjustment, as inmates are struggling to learn prison hierarchies, norms and expectations, and how to avoid being victimized (Schmid and Jones 1993). Clemmer argues that this process, “prisonization,” moves inmates away from their prior lived experiences and encourages more adoption of violence and antisocial attitudes. In particular, inmates who perceive a need for self-protection may assimilate to prison culture more readily, and these pressures may encourage them to change their attitudes and beliefs to gain entry into prison subgroups.

To be accepted by subgroups, inmates must engage in what Goffman (1956:265) calls “impression management.” For example, Skarbek (2014; see also, Trammell 2012) finds that white inmates may adopt more racist values in order to secure protection from other whites in prison. Further, Schmid and Jones (1993:440) show that first-time inmates are able to shed their status as “fish” in the eyes of seasoned prisoners by increasing their participation in prison life. While this process may be an act for some inmates who feel it is a necessary survival tactic, other prisoners may be permanently changed, acquiring identities and values consistent with specific inmate subcultures. While extremists who are radicalized outside of prison versus inside of prison may share similar attitudes with regard to their extremist leanings, those who are radicalized in prison may be more exposed to violent forms of extremism. For example, in his formulation of differential association theory, Sutherland (1947) argues that when individuals are exposed to more pro-deviant sentiments, they will be more likely to share those sentiments and spread them to others. Social learning theorists (Bandura 1969; Akers 1985; Akers and Jennings 2009) have built on this argument to conclude that prisoners are strongly influenced by the norms and behaviors of other inmates in their networks. Prisoners are quite literally a captive audience for other prisoners, many of whom have long criminal histories. The exposure is frequent and intense and Lindquist (2000) finds that prisoners who interact more frequently with other prisoners are also more hostile. Griffin and Hepburn (2006) show that those who join prison gangs are more likely to commit violent misconduct as well, regardless of their individual characteristics.

While research on inmate cultures and violence has grown dramatically in recent years (Kreager et al. 2016; Schaefer et al. 2017), we know relatively little about how experiences in prison affect post-release extremist political violence. However, we see little reason to conclude that compared to more common forms of criminal behavior, these general processes are different for violent political extremism. Accordingly, we assume that the general tendency of prison to push individuals into more violent forms of criminal behavior should extend to violent political extremism and we hypothesize that:

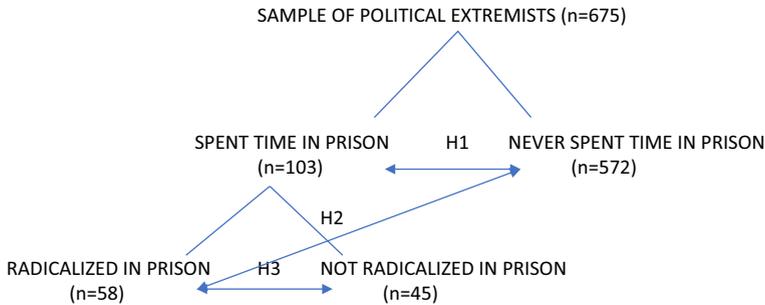


Fig. 1 Radicalization and time in prison

H1 Compared to ideologically motivated political offenders who have never been to prison, ideologically motivated political offenders who have been to prison will be more likely to turn to violent extremism upon release.

Prison Influenced Radicalization

As shown in Fig. 1, our data allow us not only to contrast political extremists with and without prison experience, but also to compare those who radicalized in prison and those who radicalized elsewhere. Corrections researchers have long recognized that living in a prison environment is difficult, with prisoners threatened by the possibility of victimization and required to adapt to new and often harsh environments (Sykes 1958; Goodman 2014; Walker 2016). Recent studies have also shown that levels of stress in prisons are extraordinarily high (Binswanger et al. 2011). Furthermore, many prisoners come from socially and economically marginalized groups and have experienced trauma and adverse childhood and adolescent experiences that may have made them especially vulnerable to psychological stressors and less able than others to cope effectively with the chronic strains of prison life (Massoglia 2008; Patterson 2010; Cloud et al. 2015).

From this perspective, prisoners may be an attractive target population for recruitment and radicalization. Their regular contacts with family and friends are reduced or eliminated (Comfort 2009; Clear 2007; Rose and Clear 1998). Their time in prison is also likely to disrupt long-term romantic relationships, leading to a high likelihood of isolation post release (Massoglia et al. 2013; Huebner 2005). In short, prisoners represent an extremely vulnerable population, isolated and often alienated, and forced to interact intensively in a closed environment. We argue that many of these characteristics should also make prisoners susceptible to radicalization to violent extremism. According to Moghaddam (2004), isolation is an important precondition for the evolution of extremist organizations because it heightens group conformity and cohesion. Cilluffo et al. (2006a) argue that extremists of all kinds prey on the alienation that often accompanies isolation from mainstream social interaction. In general, this alienation can drive prisoners to seek spiritual meaning, to establish new prison identities and to seek physical protection against daily threats of violence by other inmates.

These processes may make prisons uniquely well suited for encouraging the adoption of violent anti-social attitudes and behaviors (Hamm 2008; Neumann 2010). Evidence suggests that when becoming radicalized, it is common for individuals to experience long periods of intense social interaction with small groups, which heightens feelings of isolation

(Silke 2008). This relief provides individuals not only with the motivation to seek out other similar group members but also to accept their opinions and beliefs. These behaviors and conditions are typical in the prison environment and likely play a role in prison radicalization as they increase inmates' susceptibility to violent extremist ideologies. Compared to those outside prisons, prisoners are likely to be especially receptive to sentiments that glorify anti-social and anti-state violence (Useem and Clayton 2009). In sum, such circumstances produce individuals who may be easier to radicalize and recruit to violent action than individuals outside of prison.

In support, Hogg (2007) and Hogg and Adelman (2013) find that individuals who perceive their future to be bleak and uncertain are more likely to seek out groups that can provide them with scripts for what to believe and how to behave. Additionally, the more uncertain individuals are, the greater their chances of searching for groups that appear cohesive, clearly structured, and distinct from other entities (Abrams and Hogg 1990; Hogg and Adelman 2013; Hogg et al. 2007, 2010). This can make extreme groups (cults, radical religious groups, violent gangs) more appealing and attractive than other groups because they provide individuals with more rigidly defined, highly prescriptive social identities (Abrams and Hogg 1990; Hogg and Adelman 2013; Hogg et al. 2007). Such groups are well positioned to recruit inmates who are suffering from alienation and isolation. In fact, radicalization may follow a prison gang model: the most vulnerable—usually consisting of individuals who are alienated because they are no longer in contact with their friends or family—are targeted by charismatic leaders (Hamm 2008; Peterson et al. 2004). Inmate leadership that possesses such charisma may be an important proselytizing factor in prisoner radicalization. We expect that radicalized others validate the use of violence as a legitimate means to desirable political ends. When people perceive important others to be willing to engage in violent acts, such behaviors are likely to be perceived as less extreme and more normative, which can subsequently decrease objections against violence and make it easier to deviate from broad social norms (Peterson et al. 2004).

Hamm (2008) argues that the religio-ideological gang model has a strong influence on the radicalization process because it provides prisoners with an organizational structure and an outlet in which they can conduct their daily lives. For example, in exchange for protection from other prisoners who threaten them, members of groups such as jam'iyyat U-Islam Is-Saheed, demand that their fellow prisoners accept their violent message, and carry it with them upon their release from prison (Hamm 2009). An example of such extremist religio-ideologies is "Prislam," which consists of "gang-like cliques" that use cut-and-paste versions of the Qur'an to give a religious layer and justification to their violent and criminal activities (Hamm 2008). This form of "Jailhouse Islam" is unique to prison and fulfills the needs of prisoners who feel powerless and are seeking a higher meaning for their lives. It incorporates into the religion the values of gang loyalty and violence, and justifies these prisoners' already violent tendencies (Mueller 2006). The force of empowerment may be especially great when an individual's need to matter or to belong is threatened. Indeed, past research (Kruglanski et al. 2014; Jasko et al. 2017; Webber et al. 2016) demonstrates that under conditions of threat and self-uncertainty, individuals may become more strongly identified with their groups and more willing to sacrifice themselves for their groups. In addition, given the tendency for prisoners to become disconnected and isolated from contacts on the outside, extremist networks formed while in prison could become their central networks—making prisoners likely to cast aside the perceptions and needs of former social ties.

Following this reasoning, we expect that those who radicalized in prison may be disproportionately influenced by exposure to violent political extremists compared to those

who radicalized outside of prison. Immersion in a prison subculture is a common way for prisoners to adapt, but developing ties with other prisoners can exacerbate involvement in crime, including extremist political violence. Political extremists on the outside may hold a comparable set of beliefs to those who are radicalized in prison, but as Goffman (1956) noted more than a half century ago, the prison environment is a unique setting that concentrates an individual's exposure to stressors (requiring adaptation) and to criminogenic influences (which may be more intense and frequent with increased adaptation). Outside of prison, political extremists may not have the dense social networks of likeminded individuals that exist in prison. The forced nature and close quarters of prison life likely increases an individual's exposure to other extremists and to pro-violent attitudes. In short, these considerations support two additional hypotheses:

H2 Compared to ideologically motivated political offenders radicalized elsewhere, ideologically motivated political offenders who were radicalized in prison will be more likely to turn to violent extremism post release.

H3 Compared to ideologically motivated political offenders who were in prison but who were not radicalized there, ideologically motivated political offenders who were radicalized in prison will be more likely to turn to violent extremism post release.

Data

Our analysis is based on the Profiles of Individual Radicalization in the United States data (PIRUS 2018; Jensen et al. 2015; LaFree et al. 2018). PIRUS contains demographic, group affiliation and contextual information for a sample of 675 adults who were 21 years or older, espoused far left, far right, Islamist or single issue ideologies,⁵ and committed ideologically motivated extremist political behavior in the United States from 1948 to 2013.⁶ All data are based on unclassified, open sources and were collected in three waves between January 2013 and June 2015. The research team began by reviewing publicly available sources, including court documents, online news articles, newspaper archives, open-source non-government reports (e.g., the Southern Poverty Law Center), unclassified government reports (e.g., annual FBI terrorist reports), and existing terrorism-related datasets (e.g., the Global Terrorism Database). To be eligible for inclusion in PIRUS, each individual had to have been arrested, indicted or convicted of an ideologically motivated offense, killed by authorities as a result of an ideologically motivated offense, or recognized as a member of a designated terrorist organization (for foreign groups) or violent extremist organization (for domestic groups). Each of the 675 individuals appears only once in the dataset. Killed in action includes suicide attacks, being killed during an attempted arrest by security forces, being targeted by security forces, or being killed by an unmanned aerial vehicle.

⁵ Individuals could be coded as subscribing to more than one ideology. For a full description of the ideologies and coding rules, see PIRUS (2018, pp. 3–5).

⁶ We acknowledge that the time period covered by the data is quite long—in part a feature of the fact that political extremism is a relatively rare event and gathering a large data set requires a long time frame. In general, 98.1% of the cases (662 cases) in the analysis occurred after 1970 and 91.9% (620 cases) after 2000. All cases were coded retrospectively in three waves between 2013 and 2015 using the same criteria for the entire period.

PIRUS includes individuals from 111 designated terrorist groups (e.g., al-Shabaab, Kurdistan Workers Party) and 52 violent extremist groups (e.g., Aryan Republican Army, Sovereign Citizens).⁷ Attributed membership in these organizations was based on open sources and included individual membership claimed by the group, membership claimed by legal authorities and self-identified membership.

In addition to meeting one or more of the above requirements, to be included in PIRUS individuals must have radicalized primarily in the United States and there must be evidence that individuals espoused ideological motives in committing the behavior that got them into the database. To determine whether individuals were radicalized primarily in the United States, PIRUS researchers sought data from open sources showing that most or all of the individual's politically motivated behavior occurred while they were residing in the United States. PIRUS researchers interpret "espoused ideological motives" as evidence from open sources that ideological motives (e.g., far right, far left) were the prime driver in the decision to engage in illegal behavior. This includes crimes committed in furtherance of ideological goals, such as attacks or providing logistical support to terrorist or violent extremist groups. It does not include crimes that are connected to a designated terrorist organization or violent extremist group but are committed for non-ideological reasons. For example, an arms dealer who sells weapons to extremist groups but also criminal gangs and other non-ideological actors would not be included.⁸

Researchers double-coded approximately 10% of the individuals in the data to allow for iterative reliability tests of the data collection process and used the Krippendorff's alpha procedure to test for inter-rater reliability across the double-coded cases (Hayes and Krippendorff 2007). The score for the first wave of data collection was 0.68, the score for the second wave was 0.73, and the score for the third wave was 0.76. As a standard for acceptable reliability is 0.7, these scores indicate that the data are reliable and that the coding procedure improved between the three waves of full coding. After comparing the double-coded cases, researchers debated any discrepant coding results and came to an agreement on the coding decision that best represents the information in the available news sources and most closely aligns with the codebook.⁹

Violent and Nonviolent Political Extremism

Our definitions and coding of the dependent, independent and control variables are based on the PIRUS codebook version 1.6. In Table 1 we show coding, descriptive statistics and missing values for all variables included in the analysis. The dependent variable (violent/non-violent) is coded "1" for individuals whose earliest public exposure (i.e., action they undertook that resulted in their initial identification in public sources as an extremist) involved an act of violence and "0" for individuals involved only in non-violent acts. Following the codebook, we include as violent all actions where individuals actively

⁷ A complete list of both groups is available on request.

⁸ The most common reason for eliminating cases during the criteria coding stage was their failure to meet the inclusion requirement that they had radicalized in the United States. While every effort was made to ensure the representativeness of the data, given our reliance on open-sources, we cannot rule out the possibility that our sample is also influenced by news reporting trends. For more details on the data and the data coding process, see PIRUS (2018) and Jensen et al. (2015).

⁹ Although the PIRUS team continually updates and revises the data as new information is discovered, to this point in time we have not had sufficient resources to double code the full data set.

Table 1 Coding and descriptive statistics for dependent and independent variables

Variable	Code	Distribution mean (SD) (%)	N	% Missing values
Dependent variable	No (0)	48.44	675	0
	Yes (1)	51.56		
Independent variables	No (0)	84.74	675	0
	Yes (1)	15.26		
Prison time	No (0)	43.69	103	0
	Yes (1)	56.31		
Prison radicalization	No (0)	2.67	388	49.93
	Yes (1)	19.58		
Control variables	No (0)	24.33	388	49.93
	Yes (1)	75.67		
Radical friend	No (0)	53.41	413	45.48
	Yes (1)	46.59		
Employment status	Employed (0)	58.42	413	45.48
	Self-employed (1)	19.02		
History of mental illness	Unemployed, looking for work (2)	7.34	675	0
	Unemployed, not looking for work (3)	7.33		
Previous criminal activity	Student (4)	8.97	675	33.93
	Retired (5)	1.63		
Previous (non-violent) serious criminal activity (2)	No (0)	89.33	446	33.93
	Yes, according to public/popular speculation (1)	5.48		
Previous (non-violent) minor criminal activity (1)	Yes, professionally diagnosed (2)	5.19	446	33.93
	No previous criminal activity (0)	57.84		
Previous (non-violent) serious criminal activity (2)	Previous (non-violent) minor criminal activity (1)	18.83	446	33.93
	Previous (non-violent) serious criminal activity (2)	10.76		

Table 1 (continued)

Variable	Code	Distribution mean (SD) (%)	N	% Missing values
Age	Previous violent crime (3)	12.56		
	<25 (1)	26.22	656	2.81
	26–50 (2)	56.74		
	> 51 (3)	15.39		

participated in ideologically motivated actions that resulted in casualties or injuries or were clearly intended to result in casualties or injuries but failed, or where individuals were charged with conspiracy to kill or injure but were interdicted before they could act. The most common type of violent action includes murder, assault, armed robbery, kidnapping, bombing, and arson (but not if perpetrators purposely avoided human casualties). Non-violent ideologically motivated action includes property destruction/vandalism, illegal protest, armed standoffs that were defused without injury, receiving training by a terrorist organization but not acting on it, inciting others to violence but not directly engaging in violence, threatening violent actions without operational progress toward a plot, possession of illegal weapons without operational plans for violence, and support of terrorist groups through nonviolent tactics (e.g., filing false liens, tax fraud). In general, we treat as non-violent all cases where it is clear from source documents that individuals did not intend to harm others. According to Table 1, the total number of violent and non-violent cases is almost evenly split in our sample.

Independent Variables

As shown above in Fig. 1, the detailed nature of our data allows us to explore three related hypotheses. We begin with a sample of adults (21 and older) who have committed illegal acts of political extremism and for whom we have detailed information on whether they served time in prison and if so, their prison radicalization experiences. We include two variables to test our hypotheses. *Prison time* measures whether prior to their date of public exposure for the behavior that got them into the PIRUS data, did individuals ever serve time in prison for a non-ideologically motivated illegal behavior. To test the first hypothesis, we code prison time as “1” for individuals who spent time in prison (103 cases) and “0” for those who did not (572 cases). Approximately 15% of our sample had spent time in prison before coming to public attention for participating in an ideologically motivated offense.

Prison radicalization uses open sources to measure the extent to which individuals went through an ideological radicalization process (in either behaviors or beliefs) while in prison, and is coded “1” for individuals who radicalized fully or partially while in prison and “0” for those who radicalized elsewhere. If sources indicated that the individual went to prison, but did not specify whether prison influenced their radicalization, we assumed that radicalization took place outside of prison.¹⁰ Among the 103 individuals who spent time in prison, 56% radicalized fully or partially while in prison. To test the second hypothesis, we contrast the violent behavior of those who radicalized in prison ($n=58$) with those who never spent time in prison ($n=572$). And to test the third hypothesis, we contrast the violent behavior of inmates who radicalized in prison ($n=58$) with those who were in prison but radicalized elsewhere ($n=45$).

¹⁰ While there is still no generally accepted tool for measuring radicalization (cf., Borum 2011; Hamm 2008; Neumann 2013) our data seeks sources that indicate that while in prison the perpetrators demonstrated either through their attitudes or behavior a growing commitment to ideologically motivated illegal action.

Methods

To provide strong evidence for the hypothesized links between prison experience and violent political extremism, we perform a two-stage analysis where we first preprocess the data using coarsened exact matching (CEM) and after generating a matched dataset, we then use logistic regression to calculate the conditional odds ratio for engaging in violent extremism. The CEM allows us to estimate average treatment effects (ATE) of our outcomes of interest. As Cerulli (2015) explains, this process is like posing the hypothetical question: What if an individual had been in both the treatment and the control group? Thus, the ATE refers to the difference between the population average of the level of violence when the individual is in the treatment group (i.e., spending time in prison or radicalizing there) and the average of the level of violence when the same individual is in the control group (i.e., never been to prison or not radicalized there). To estimate the ATE, we rely on regression adjustment (Wooldridge 2010) and inverse probability weighting estimators (Robins et al. 2000; Busso et al. 2009). Because these methods are relatively new to criminology, we next describe them in some detail.

Coarsened Exact Matching

According to Iacus et al. (2012), the goal of CEM is to prune observations from the data so that the remaining data have a more equal balance between the treated and control groups. Matching improves the similarity between treated and control groups and thereby reduces model dependence and bias. By discarding non-matches, we can remove the relationship between the control variables and the key causal variable (Morgan and Winship 2014; Stuart 2010). Thus, the matching estimators control for pretreatment covariates to compensate for the lack of random assignment.

To perform the coarsened exact matching we sought a set of variables that were linked to violent political extremism in the past. The small sample size forces practical constraints on the total number of confounders that can be included for the CEM procedure and post matching analyses, particularly for H3 where we compared 58 cases of individuals who were known to be radicalized in prison against 45 who were not.¹¹ Because there is little prior research supplying guidelines for the optimal number of confounders to include in CEM analysis for a given sample size, we experimented with different models and found that five variables were the maximum number that we could include given our small sample size for H3. This outcome aligns with the recommendation common to medical studies of including at least ten outcome events per predictor for multivariate regressions (Peduzzi et al. 1996; Vittinghoff and McCulloch 2007; Austin and Steyerberg 2015). As shown in Table 1, we chose five theoretically driven and empirically based variables that were shown in recent research (Jasko et al. 2017; LaFree et al. 2018) to predict violent political extremism: radical friend, employment status, history of mental illness, previous criminal activity and age. We denote

$$X = \left(\begin{array}{c} \text{Radical Friend}_i, \text{Employment Status}_i, \text{Mental Illness}_i, \\ \text{Previous Criminal Activity}_i, \text{Age}_i \end{array} \right) \quad (1)$$

¹¹ After performing coarsened exact matching, the sample size for H3 was even smaller: 36 out of 103 cases (35%) were pruned by the CEM algorithm, dropping the sample to 67 cases.

as a 5-dimensional dataset where each covariate is a column vector of observed values of the 5 variables.

When looking at percentages for individuals with non-missing data we find that over half of the sample have a radical friend known to have engaged in extremist violence. Less than 3% had no contact with radical friends. According to Table 1, a strong majority of offenders were employed or self-employed. Less than 11% of the sample reported a history of mental health problems. Over half had criminal records and over a quarter had records that included criminal violence or a non-violent felony. The average age of the perpetrators at their points of public exposure was 36 years old.

For data sets such as this one that contain only categorical variables, King and Nielsen (2016) show that among different matching schemes (Mahalanobis, propensity score and CEM), CEM is the most accurate and efficient. The process for estimating CEM is:

$$\mathbb{X}_{CEM} = M[C_\delta(X_i) = C_\delta(X_j)] \tag{2}$$

where δ denotes a specified condition for coarsening so that $\delta = 0$ leads to $C(X) = X$.

After the process of coarsening, a set of strata $s \in S$ each with some values of X is generated. In our case, the CEM algorithm retains strata that contain at least one prison and one non-prison individual, while strata containing only prison or non-prison individuals, or the lack of both, are pruned from the sample. Let m_T^s and m_C^s denote the number of prison and non-prison individuals in a stratum. The number of matched individuals for prison and non-prison are $m_T = \cup_{s \in S} m_T^s$ and $m_C = \cup_{s \in S} m_C^s$, respectively. The CEM algorithm assigns the following weights for each matched individual i in stratum s :

$$w_i = \begin{cases} \frac{m_C m_T^s}{m_T m_C^s}, & i \in C^s \\ 1, & i \in T^s \end{cases} \tag{3}$$

From (3), unmatched individuals are pruned by receiving a weight equal to zero and w_i is incorporated into the post-matching analyses that follow.

CEM is appropriate for handling data sets with substantial missing data, because unlike other matching schemes, the CEM algorithm treats missing values as a separate category that are matched in the same way as non-missing cases (Blackwell et al. 2009). Table 1 shows the proportion of missing data for the five control variables. At the most extreme, radical friend and employment status are missing data in half or nearly half of the cases. Previous criminal activity is missing in about a third of the cases. The other two control variables (history of mental illness,¹² age) are missing for less than 3% of the sample. CEM prunes cells with zero treatment or zero control units, including cells with missing data.

Iacus et al. (2012) use the \mathcal{L}_1 statistic to denote the overall imbalance between groups after the CEM process (in this case prison and non-prison groups):

$$\mathcal{L}_1(f, g) = \frac{1}{2} \sum_{I_1 \dots I_N} |f_{I_1 \dots I_N} - g_{I_1 \dots I_N}| \tag{4}$$

Let $f^{matched}$ and $g^{matched}$ denote the empirical frequencies for the matched prison and non-prison groups and f and g denote that for the unmatched prison and non-prison groups.

¹² For this analysis, we assumed that if there was no mention of mental illness in court documents or media accounts, then none existed—a decision supported by earlier research (LaFree et al. 2018).

To test for the adequacy of these methods, we rely on the measure of good matching recommended by Iacus et al. (2012):

$$\mathcal{L}_1(f^{matched}, g^{matched}) < \mathcal{L}_1(f, g).$$

If two distributions of data overlap exactly (perfect global imbalance), $\mathcal{L}_1 = 1$ and on the other hand, $\mathcal{L}_1 = 0$ when two distributions of data are completely separated (perfect global balance). In the former case, the data are balanced enough to approximate complete randomization.

Logistic Regression Analysis

We use logistic regression analysis to compute how strongly the presence of imprisonment/radicalization is associated with the presence of violent extremism. We measure the conditional odds ratio for engaging in violent extremism for the three hypotheses. Formally, the probability of observing the dichotomous outcome $Violent_i^*$ is denoted as:

$$\Pr(Violent_i = 1 | \beta) = \int_0^\infty Logistic(Violent_i^* | \mu_i) dViolent_i^* = \frac{1}{1 + e^{-x_i \beta w_i}} \quad (5)$$

where the vectors x_i and CEM weights w_i are described in Eqs. (1) and (3) respectively.

Using the CEM weights generated in the data preprocessing stage, we estimate the parameters of (5) by maximum likelihood. The likelihood function is:

$$-\sum_{i=1}^N \ln(1 + e^{(1-2Violent_i)x_i \beta w_i}) \quad (6)$$

Average Treatment Effects

In causal inference, the unconditional means of outcomes for each treatment level are estimated (Imbens and Rubin 2015), but only the outcomes of the subjects who received the treatment are observed across both observational and experimental interventions. In contrast, King and Nielsen (2016:9) argue that the CEM weights generated in the data preprocessing stage enable us to “approximate a fully blocked experimental design.” As a result, the random assignment of the prison status (treatment) assures that it is independent of the level of violence (outcome). We calculate the unconditional means by taking the average of those who engaged in violent political extremism conditional on prison status.

Under selection on observables, the regression-adjustment estimator is the recommended approach for consistently estimating average treatment effects (ATE) when the determinants of the outcome (violent against non-violent) are known. Assuming that the conditional mean independence condition holds (Wooldridge 2010), two identification conditions of the (counterfactual) potential outcomes mean is given by:

$$E(Violent_0 | x, Prison = 1) = E(Violent_0 | x, Prison = 0) \quad (7)$$

$$E(Violent_1 | x, Prison = 0) = E(Violent_1 | x, Prison = 1) \quad (8)$$

where the right-hand sides of (7) and (8) are observed and used to calculate the expected level of violence for the same individuals had they spent time in prison (7) or never been to prison (8).

The ATE¹³ is therefore given by:

$$ATE(x) = E(Violent|x, Prison = 1) - E(Violent|x, Prison = 0) \tag{9}$$

Because the outcome (nonviolent-violent) is binary, we use the nonlinear parametric (probit) regression-adjustment estimator. Post matching, to estimate the ATE in the (nearly) fully blocked experiment, we incorporate the CEM weights estimated in (3) into the logit distribution for parametric regression-adjustment:

$$\widehat{ATE} = \frac{1}{N} \sum_1^N Prison_i \left[\frac{1}{1 + e^{-x_i \hat{\beta}_1 w_i}} - \frac{1}{1 + e^{-x_i \hat{\beta}_0 w_0}} \right] \tag{10}$$

where the estimated asymptotic variance is:

$$\begin{aligned} \widehat{Asyvar}[\widehat{ATE}] &= \frac{1}{N} \left[\frac{1}{N} \sum_1^N \left[\frac{1}{1 + e^{-x_i \hat{\beta}_1 w_i}} - \frac{1}{1 + e^{-x_i \hat{\beta}_0 w_0}} - \widehat{ATE} \right]^2 \right. \\ &\quad \left. + \left[\frac{1}{N} \sum_{i=1}^N \frac{\partial}{\partial \hat{\beta}} \frac{1}{1 + e^{-x_i \hat{\beta} w}} \right] \left[\widehat{Asyvar} \sqrt{N} (\hat{\beta} - \beta) \right] \left[\frac{1}{N} \sum_{i=1}^N \frac{\partial}{\partial \hat{\beta}} \frac{1}{1 + e^{-x_i \hat{\beta} w}} \right]' \right] \end{aligned} \tag{11}$$

Once the asymptotic variance of the estimated ATE is estimated using (11), we then employ the usual two-tailed significance test to determine whether Hypotheses 1–3 are supported.

To increase confidence in the estimated ATEs, we also present the reweighting estimator based on the inverse probability propensity-score. When the determinants of treatment status (prison against non-prison) are known, Cerulli (2015) show that the inverse probability weighting regression is the natural base estimator. We argue that the reweighting estimation procedure is appropriate for our analysis because the violent and non-violent individuals present different distributions of the set of covariates *X*, when prison status assignment is not perfectly random (Brunell and Dinardo 2004; Busso et al. 2009). To render the prison and non-prison groups as much like each other as possible, individuals who had spent time in prison are penalized with lower probability to enter prison and individuals who had never been to prison are advantaged with higher probability to enter prison. To do so, we first estimate the propensity score *p(x)* by a logit to obtain the predicted probability *p_i*. Next, for individuals who had spent time in prison, we assign weights $\frac{1}{p_i}$ and $\frac{1}{1-p_i}$ otherwise. The ATE can be estimated by the comparison of the weighted means for the prison and non-prison groups (Li et al. 2009). If *p(x)* is correctly specified, the estimated ATE incorporating the CEM weights estimated in (3) is given by:

$$\widehat{ATE} = \frac{1}{N} \sum_{i=1}^N \frac{[Prison_i - \hat{p}(x_i w_i)] Violent_i}{\hat{p}(x_i w_i) [1 - \hat{p}(x_i w_i)]} \tag{12}$$

To compute the standard errors for the estimated ATE, we follow Wooldridge (2010) and define the estimated ML score of the logit incorporating the CEM weights as:

¹³ The regression-adjustment approach makes use of the potential outcome means to estimate the ATE; while the inverse probability weighting approach uses the propensity score.

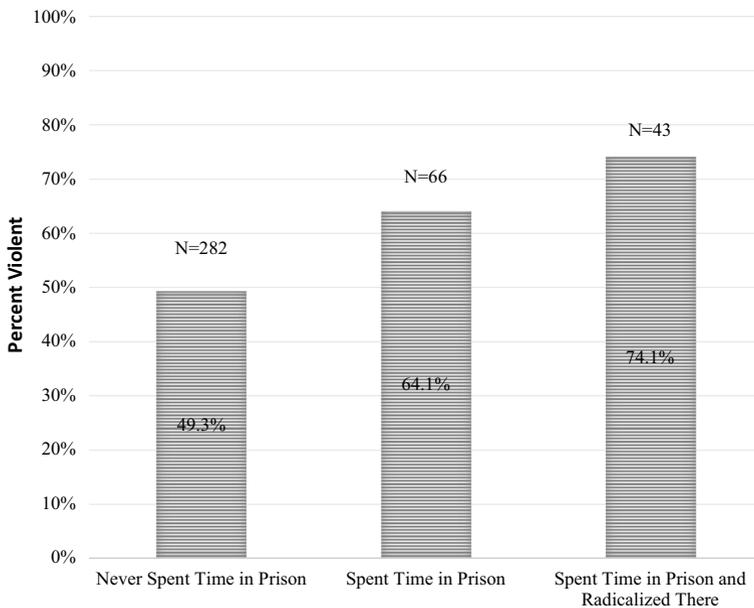


Fig. 2 Percent engaged in violent political extremism by prison experience

$$\hat{d}'_i = x_i w_i (Prison_i - \hat{p}_i) \quad (13)$$

Next, we calculate the OLS residuals from \widehat{ATE} on $(1, \hat{d}'_i)$ and denote them as \hat{e}_i . The asymptotic variance for the estimated ATE is given by:

$$\widehat{Asyvar}[\widehat{ATE}] = \sum_{i=1}^N \hat{e}_i^2 \quad (14)$$

Like the case for the regression-adjustment estimator, we can determine the significance of Hypotheses 1–3 once the asymptotic standard error of the estimated ATE is calculated.

When the ATEs for Hypothesis 1 to 3 are positive and significant, we can conclude that imprisonment/prison radicalization increases individuals' risk of being violent compared to individuals who have never been to prison or radicalized elsewhere. To gain a more intuitive measure of the criminogenic impact of imprisonment/prison radicalization, we express the ATE as a percentage of the untreated potential outcome mean. The percentage change and the standard error are computed using the delta method. Both the regression-adjustment and inverse probability weighting estimators should produce similar results under correct specification (Cerulli 2015; StataCorp 2013).

Results

In Fig. 2, we show the distribution of those engaged in violent political extremism by prison experience. Consistent with our hypotheses, the comparative results show a steady rise in the percent of individuals committing violent political acts as we move from never

Table 2 (a) Violent political extremism by prison experience (Hypothesis 1). (b) Violent political extremism for prisoners who radicalize in prison or outside prison (Hypothesis 2 and Hypothesis 3)

Prison	Violent		Total
	No	Yes	
(a)			
No (%)	290 (51%)	282 (49%)	572 (100%)
Yes (%)	37 (36%)	66 (64%)	103 (100%)
Total (%)	327 (48%)	348 (52%)	675 (100%)
Radicalized in prison	Violent		Total
	No	Yes	
(b)			
No (%)	22 (49%)	23 (51%)	45 (100%)
Yes (%)	15 (26%)	43 (74%)	58 (100%)
Total (%)	37 (36%)	66 (64%)	103 (100%)

Pearson $\chi^2(1) = 5.8371$

Table 3 Coarsened exact matching for Hypothesis 1 to 3

Variable	H1		H2		H3	
	Univariate imbalance		Univariate imbalance		Univariate imbalance	
	Before ^a	After ^b	Before ^a	After ^b	Before ^a	After ^b
Radical friend	0.075	0	0.185	0	0.250	0
Employment status	0.128	0	0.151	0	0.053	0
Mental illness	0.035	0	0.037	0	0.025	0
Previous criminal activity	0.206	0	0.336	0	0.299	0
Age	0.033	0.059	0.033	0.068	0.140	0
Multivariate L1 distance	0.267	0.197	0.413	0.223	0.561	0

^aBased on Stata code

imb employment_status radical_friend previous_criminal_activity psychological age_cat, treatment(prison_radicalize)

^bStata code used to estimate Eq. (4)

cem employment_status radical_friend previous_criminal_activity psychological age_cat, treatment(prison_radicalize)

been to prison, to spent time in prison, to radicalized there. Chances of engaging in post-prison violent extremism are about 15% higher for those who have spent time in prison than those who have not and another 10% higher for those who radicalized in prison versus those who spent time in prison but radicalized elsewhere.

Next, we report the descriptive statistics by imprisonment/prison radicalization status prior to engaging in ideologically motivated extremist behavior. For Hypothesis 1, Table 2a shows that 64% (66/103) of politically motivated extremist offenders who spent time in prison committed violent acts compared to 49% (282/572) of politically motivated

Table 4 Odds ratio and robust standard error for logistic regression for Hypothesis 1 to 3

Hypothesis	Without CEM ^a Odds ratio (Robust Std. Err.)	N	CEM ^b Odds ratio (Robust Std. Err.)	N
<i>H1</i>				
Prison radicalization	1.77** (0.385)	675	1.78** (0.366)	638
<i>H2</i>				
Prison radicalization	2.81** (0.872)	630	2.87** (0.859)	476
<i>H3</i>				
Prison radicalization	3.00** (1.240)	103	2.50** (0.854)	67

** $p < 0.01$; Robust standard error in parenthesis

^aStata code

logistic violent_prison_radicalize employment_status radical_friend previous_criminal_activity psychological_age_cat, noconst vce(robust)

^bStata code

logistic violent_prison_radicalize [iweight=cem_weights], noconst vce(robust)

extremists offenders who had not spent time in prison. For Hypothesis 2, Table 2b shows that 74% (43/58) of offenders who radicalized in prison committed violent acts compared to 49% (282/572) of offenders who had not spent time in prison. For Hypothesis 3, Table 2b shows that 74% (43/58) of offenders who radicalized in prison committed violent acts compared to 51% (23/45) of offenders who had spent time in prison but did not radicalize there. Chi-square tests for Table 2a are significant ($p < 0.01$) and tests for Table 2b are in the expected direction and nearly significant ($p < 0.1$). In short, the bivariate results provide moderate to strong support of our three hypotheses.

Coarsened Exact Matching Analysis

In Table 3 we show the univariate and multivariate imbalances for Hypothesis 1 to 3 before and after CEM is applied. For H1 and H2, the CEM procedure eliminated almost all sources of confounding and selection bias for all the variables, except for Age where the univariate imbalance rose slightly (e.g., for H1, the univariate imbalance for Age increases from 0.033 to 0.059). The CEM procedure removed all sources of data imbalance in H3. The \mathcal{L}_1 statistic for Eq. (4) for H1 to H3 are reported in the last row of Table 3 and as shown, the global imbalances decreased significantly after matching. Taken together, these results show that the matching process greatly lowers the imbalances in the data. This means that post matching, our data set is less model dependent and carries less selection bias. We therefore conclude that after the CEM is applied, the data are balanced enough to “approximate a fully blocked randomized experimental design,” as King and Nielsen (2016:9) anticipated.

Logistic Regression Analysis

We present the estimated logistic regression coefficients for our three hypotheses (based on equation #5) in Table 4. As expected, our sample sizes are reduced considerably

Table 5 Coefficient and robust standard error for average treatment effect estimators for Hypothesis 1 to 3

Hypothesis/estimator	Average treatment effect ^a	Coefficient (Robust Standard Error)			N
		Potential outcome means (0) ^b	Potential outcome means (1) ^b	Percentage change (%) ^c	
H1					638
Regression adjustment (Probit)	0.126** (0.052)	0.514** (0.022)	0.640** (0.047)	24.60* (10.90)	
Inverse probability weighting	0.126** (0.052)	0.514** (0.022)	0.640** (0.047)	24.60* (10.90)	
H2					476
Regression adjustment (Probit)	0.242** (0.062)	0.499** (0.024)	0.741** (0.057)	48.53** (13.62)	
Inverse probability weighting	0.242** (0.062)	0.499** (0.024)	0.741** (0.057)	48.53** (13.62)	
H3					67
Regression adjustment (Probit)	0.183 (0.122)	0.532** (0.099)	0.715** (0.069)	34.32 (28.41)	
Inverse probability weighting	0.183 (0.122)	0.532** (0.099)	0.715** (0.069)	34.32 (28.41)	

* $p < 0.05$; ** $p < 0.01$; robust standard error in parenthesis

^aThe ATE is computed using the potential outcome means for the regression-adjustment model, and using the propensity score for the inverse probability weighting model. Stata codes

teffects ra (violent, probit) (prison_radicalize) [iweight=cem_weights], vce(robust)

teffects ipw (violent) (prison_radicalize) [iweight=cem_weights], vce(robust)

^bStata codes

teffects ra (violent, probit) (prison_radicalize) [iweight=cem_weights], pomeans vce(robust)

teffects ipw (violent) (prison_radicalize) [iweight=cem_weights], pomeans vce(robust)

^cStata codes

teffects ra (violent, probit) (prison_radicalize) [iweight=cem_weights], coeflegend vce(robust)

nlcom _b[ATE:r1 vs 0.prison_radicalize]/_b[POmean:0.prison_radicalize]

teffects ipw (violent) (prison_radicalize) [iweight=cem_weights], coeflegend vce(robust)

nlcom _b[ATE:r1 vs 0.prison_radicalize]/_b[POmean:0.prison_radicalize]

when we use the CEM analysis (e.g., for H2 the sample declines from 630 to 476 or 24.4%). Nevertheless, the substantive conclusions are similar whether we do the analysis with or without CEM. Thus, comparing the prison and non-prison populations for Hypothesis 1, Table 4 shows that the odds ratio for the logistic regressions with and without CEM are highly significant. In general, spending time in prison increases the post-release risk of engaging in violent acts by 77–78%.

Similarly, to test Hypothesis 2, we compare the imprisoned and radicalized group against the non-prison group. According to Table 4, we again find significant support for the hypothesis for logistic regressions with and without CEM. Depending on whether CEM is applied, political extremists who were radicalized in prison are 171–187% more likely to commit violent acts than political extremists radicalized elsewhere.

Finally, to test Hypothesis 3, we compare the group radicalized in prison to the group who spent time in prison but radicalized elsewhere. We again find statistically significant support for our hypothesis regardless of the specific method used. Compared to individuals who were in prison and did not radicalize there, individuals who were in prison and radicalized there were 150–200% more likely to engage in post-prison violent extremism. In short, the logistic regression results, both with and without CEM, show that imprisonment and prison-influenced radicalization are strongly associated with violent political extremism after prison.

Estimating Average Treatment Effects

To provide further support for our findings, in Table 5 we present the results of applying regression adjustment and inverse probability weighting estimators to our three hypotheses. In support of Hypothesis 1, the ATE coefficient for the regression adjustment estimator is positive (0.126) and significant ($p < 0.01$). We show that spending time in prison increases individuals' level of post-prison violence by an average of 12.6 percentage points from the average of 0.514 for individuals who did not spend time in prison. We can interpret the coefficient for the potential outcome means (0) as showing that if none of the individuals in our sample spent time in prison, the expected average level of violence would be 0.514. By contrast, as shown by the coefficient for the potential outcome means (1), the expected average level of violence if all individuals spent time in prison is 0.64. Thus, we estimate that imprisonment increases the chances of violence by 24.51% on average ($[(0.640 - 0.514)/0.514]$), a statistically significant increase.¹⁴

In our second hypothesis, we argue that individuals who were radicalized in prison commit more violent acts, compared to individuals who were radicalized elsewhere. In support, the results show that if none of the individuals were radicalized in prison, the expected level of post-prison violence would be 0.499. In contrast, if all the individuals were radicalized in prison, the expected level of post-prison violence would be 0.741, a difference of 0.242 as shown by the ATE. Compared to imprisonment alone, the compounded effects of imprisonment and prison radicalization increase violence by 48.53% on average. We therefore conclude that individuals who were radicalized in prison are more likely to commit a violent act, compared to individuals who were radicalized elsewhere. Comparing risks for the prison versus the non-prison group and the imprisoned and radicalized versus the non-prison group, the increase in likelihood of engaging in violent political extremism when radicalization occurs in the context of prison is almost doubled ($(48.53 - 24.6)/24.6$).

Finally, our third hypothesis predicts that individuals radicalized in prison will be more likely to commit post-release acts of extremist violence than other prisoners who were radicalized elsewhere. Among the group of prisoners, if none were radicalized in prison, the expected level of violence is 0.532. However, the expected level of violence increases to 0.715 if all prisoners were radicalized in prison. Although these results are in the same direction as those for the first two hypotheses, the percentage change did not reach statistical significance.¹⁵

¹⁴ For the percentage change coefficient and standard error, we made use of the command "nlcom," calculated with the delta method.

¹⁵ We also performed an additional robustness check by using a multiple imputation method called Amelia II (Honaker et al. 2011) to ensure that the estimated likelihood of engaging in violent extremism is not being driven by our handling of missing data. We generated 5 complete data sets using Amelia II before running CEM. After establishing the validity of the 5 imputed data sets derived from Amelia II, we next

Discussion and Conclusion

Past research shows overwhelming evidence that prison experiences play a major role in shaping the subsequent life experiences of ex-convicts (Western 2002; Sykes and Pettit 2014; Green and Winik 2010). Given this well-supported conclusion, we find it surprising that there is little consensus about the impact of prison on violent political extremism. Our contention is that the lack of a connection between prison experience and violent political extremism is likely a result of the absence of appropriate data and the fact that most prior research does not examine the post-prison experiences of ex-convicts and concentrates only on those who have committed violent acts, thereby limiting variation in the dependent variable. In this study, we confronted these limitations by introducing a data set that includes a large sample of individuals who have committed ideologically motivated violent and non-violent crimes in the United States, and then traces their previous experiences with prison and radicalization. Our data cover a wide variety of cases, both in terms of perpetrators' ideological goals and the means they employed to pursue these goals.

Despite this diversity, the analysis shows that the use of violence can be estimated in part by whether perpetrators spent time in prison and whether they were radicalized there. Using a matching technique to approximate a fully blocked experimental design in the data preprocessing stage, our logistic regression estimates show consistent evidence that imprisonment and radicalization in prison increase the likelihood of violent political extremism post release. In addition, both sets of analyses show that the compound effect of imprisonment and prison radicalization is greater than imprisonment alone: when radicalization occurs in the context of prison, the criminogenic effect of imprisonment is doubled. The results using a variety of estimators are extremely consistent, providing similar conclusions across various types of modeling strategies.

Although the United States has largely adopted a punitive approach to incarceration (Tregua and Larmour 2009:16), the vast majority of prisoners will eventually be released. Monahan (2017) points out that in the case of individuals convicted of violent political extremism, these releases may raise national security concerns. We do not have reliable estimates of how many individuals with terrorism-related charges are released from U.S. prisons each year. However, we know that more than half a million prisoners of all types are released from state prison facilities annually, a number that is dwarfed by the millions released from local jails (Carson and Golinelli 2014).

Among the many reasons to be concerned about large numbers of prisoners released each year is the criminogenic effect prison can exert on future offending (Nagin et al. 2009). Our study builds on a body of research suggesting that these effects extend to participation in politically motivated extremist groups and crimes (Blazak 2009; Hamm 2008). On the one hand, it is possible that extremists who spend time in prison or who are radicalized there are more likely to commit violence through similar channels that magnify other types of offending. This "school of crime" hypothesis suggests that prison breeds more violent criminals through enhanced exposure to criminal peers (Gendreau et al. 1999; Nguyen et al. 2017). On the other hand, prisons may also present a unique threat in terms of producing ideologically motivated violent offenders. Prison strains or eliminates contact with outside ties, which are by default more likely to be pro-social and normative than ties

Footnote 15 (continued)

used them to quantify the strength of association between violent extremism, imprisonment and radicalization. The results, available on request, were substantively identical to those reported here.

formed inside prison. Extremist groups are also more likely to target individuals who are socially isolated and likely more vulnerable to joining such groups. In fact, a report by The Sentencing Project (2009) finds that many of those who become involved in racist groups in prison do so out of a perceived need for protection. In general, our study underscores the importance of future research into the risks and consequences of prisons and prison radicalization for violent political extremism. In addition, future work should focus on the characteristics that make some inmates more susceptible to engaging in violent political extremism.

We acknowledge several weaknesses in the present study. First, our study, like others that rely on open sources to study political extremism (Freilich et al. 2014; Gill et al. 2014; Safer-Lichtenstein et al. 2017), has large amounts of missing data on several variables. We adopted a relatively new methodological approach in our analysis to respond to this weakness and also performed several robustness checks. In the study of political extremism, like the study of more ordinary crime, we face methodological trade-offs. While the limits of open source data in this area are clear, more traditional methods like surveys and case studies also have corresponding weaknesses. Moreover, studies of political extremists in the United States have been hampered by the unwillingness of prison officials to grant researchers access to inmates and their records. Future research that triangulates open sources with inmate interviews and prison records would be extremely useful.

Second, while many theories of radicalization (Neumann 2013; Borum 2011; McCauley and Moskalkenko 2011) conceptualize it as the culmination of multiple, dynamic pathways, our data do not allow us to measure with precision the temporal ordering of the variables we include. For example, we know whether individuals served time in prison but we do not know how long they served. We also do not have detailed information about the security levels of the prisons in which they served or their participation in specific prison programs. Life histories of inmates that allowed more detailed temporal ordering of key events would be useful, but of course also have their own inherent limitations.

Finally, given that our sample is limited to U.S.-based extremists, we cannot generalize our results to other countries or regions. In fact, there is evidence that the characteristics and ideologies of perpetrators serving time in prisons on terrorism-related charges differ considerably across countries (Neumann 2010; Rabasa et al. 2010). Cross-national comparative research on these topics would be valuable.

Many researchers (Useem and Kimball 1991; Goldstone and Useem 1999) have noted that after reaching a high point in the 1960s and 1970s, riots and violence in U.S. prisons have been relatively uncommon. This observation is sometimes used to suggest that more effective management of prisons has reduced the impact of politically motivated violence within prisons and therefore imprisonment in the case of political extremism within the U.S. prison system presents relatively few societal risks in the current period. However, our results suggest that the impact of prison and prison radicalization on the post-prison experiences of perpetrators may be greater than this conclusion implies. In particular, we find that prison itself as well as radicalization within prison are predictive of future violent political extremism.

Our finding that spending time in prison is a significant predictor of engaging in violent extremist behavior suggests that domestic policy on countering violent extremism (CVE) should leverage existing programs geared toward steering at-risk youth away from crime and time in prison. It also suggests that there may be CVE-relevant benefits to rehabilitation programs for non-ideological criminals. Efforts to reduce recidivism among inmates recently released from the criminal justice system may also be useful for preventing the most severe types of behavior among radicalized individuals. Finally, if support for violent

political ideologies in prison is fueled by the social isolation experienced by inmates, prison administrators could consider increasing allowances for visitations from outside social ties, which has also been shown to reduce post-prison crime and violence in general (Mears et al. 2012). Our over-arching conclusion is that among ideologically motivated political extremists in the United States, past prison experience and radicalization within prison have a significant effect on the propensity toward violence.

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