Deal Drugs Once, Deal Drugs Twice: Reinforcing Peer Effects in Prison on Recidivism*

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Abstract—Given its illegal nature, criminal activity is likely to be learned through social interactions. Few studies, however, estimate a causal relationship between social networks or peer interactions and individual delinquency. This study investigates the effects of other inmates' criminal background on crime-specific recidivism among young adults incarcerated for the first time. For drug offenders we find robust evidence that exposure to other young drug offenders while serving time increases the probability of recidivism with a drug-related offense, i.e., reinforcing peer effect for drug criminals. By contrast, we do not find strong evidence of peer effects for other types of crimes. We also show that the definition of the peer group is of key importance for testing the existence and magnitude of peer effects in prisons. Indeed, we find strong evidence of reinforcing peer effects when defining peers as inmates of similar criminal background and age, whereas we find little evidence of peer effects when defining peers as inmates of similar criminal background but irrespective of their demographic characteristics. Our findings suggest that prison assignment policies can be used to prevent recidivism of young offenders with a drug-related criminal background.

Keywords: crime, peer effects, young offenders, prisons

JEL Classification codes: K4, J10

1.   Introduction

Crime yields high social costs (for US evidence, see, e.g., Anderson, 1999). There is extensive evidence that the tendency to commit crime is much higher for men and peaks in late adolescence and early adulthood (Hirschi and Gottfredson, 1983; Greenberg, 1985; Hirschi and Gottfredson, 1985; Steffensmeier et al., 1989; Andersen and Tranæs, 2011). Given its illegal nature, criminal activity is likely to be learned within social networks and through peer interactions.[1] Previous findings document the importance of social networks in determining criminal activity (Case and Katz, 1991; Reiss, 1988; Glaeser et al., 1996; Ludwig et al., 2001; Kling et al., 2005). Few studies, however, estimate a causal relationship between peer interactions and individual delinquency. Three notable exceptions are Ludwig and Kling (2007); Bayer et al., (2009); and Damm and Dustmann (2012).[2] Exploiting the Moving-To-Opportunities Demonstration, Ludwig and Kling (2007) find no effect of neighborhood crime—measured by the number of committed violent crimes reported in the police beat per 10,000 inhabitants—on juvenile arrests for violence. Exploiting quasi-random assignment of refugees over Denmark, Damm and Dustmann (2012) find no effect of neighborhood crime—measured by the rate of committed violent crimes—on juvenile delinquency. However, they argue that the share of *young* criminals in the neighborhood better accounts for social interactions with delinquent peers living in the neighborhood. Using this measure of neighborhood crime, they establish a causal relationship between growing up in a highly criminal neighborhood and male juvenile delinquency. Furthermore, they find that the youth crime conviction rate of individuals from the same ethnic group matters more than the overall youth crime conviction rate in the neighborhood. Exploiting random variation in the duration of time-overlap between juveniles in the same correctional facility and data from Florida, Bayer et al. (2009) show that young inmates acquire and even strengthen criminal capital behind bars due to peer effects. In particular, a youth who serves time with juvenile offenders with similar criminal background is more likely to recidivate with the same type of offense.

Our study investigates whether young individuals acquire criminal capital in sentencing facilities due to peer effects. The offenders in our sample serve time with inmates who differ not only in terms of criminal background but also in terms of demographic characteristics like

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[1] See also, e.g., the pioneer works of Becker (1968) on the determinants of criminal behavior and Freeman (1999) for an extensive literature review.

[2] Another recent study (Corno, 2012) brings evidence that peers affect criminal behavior among the homeless. Corno directly observes individuals' networks and, using instrumental variables, identifies strong peer effects: The probability of arrest of the homeless increases by 20 percentage points when acquainting other homeless people with a criminal record.

age, ethnicity and county of residence. We expect young offenders to have more social interactions with offenders with both a similar criminal background and similar demographic characteristics. In other words, we expect stronger peer effects on individual recidivism with a repeat offense due to the share of inmates with similar age or ethnicity and similar criminal record than due to the share of all inmates with similar criminal record. If our hypothesis holds, a policy that groups inmates with similar criminal background and demographic characteristics may have the unintended effect of increasing exposure to peers who can facilitate a criminal career.

We add to the literature in at least three ways. First, using linked administrative and criminal data from Danish registers over 10 years, we estimate peer effects in prisons for first-time incarcerated individuals aged 18 to 22. To date, there is only evidence about peer effects among juveniles. Second, our study offers a test as to whether the results of Bayer et al. (2009) hold in a different institutional context than the one of Florida. In addition to a different offer of training and programs *during* incarceration, young inmates in Denmark can benefit from a more accessible educational system, different labor market opportunities and policies *after* incarceration that all can ease reinsertion in the society and prevent new criminality. Hence, this paper takes a new look at peer effects from prison on recidivism by focusing on a new age group and a different institutional context compared to the Bayer et al. (2009) study. Moreover, as our data covers all sentencing facilities in Denmark, we examine whether peers' effect on crime varies with the type of sentencing institution—open, closed, or local prison. Third, we use several peer definitions, distinguishing peers not only by criminal background but also by demographic characteristics as presented in the following paragraphs.

Using a unique person identifier, we link records on incarceration, charges, and convictions for the entire Danish population from the central Police registers with Danish administrative registers. To ensure that any peer effect reflects true criminal capital transmission behind bars and is not due to past incarceration, we extract a sample of individuals incarcerated for the first time at age 18 to 22 between 1994 and 1997 and look at their criminal convictions within one year after release.[3] As Bayer et al. (2009), we use facility-by-prior-offense fixed effects to deal with possible non-randomness in prison assignment and identify peer effects from the random variation in the duration of time-serving

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[3] In Denmark, the minimum age of criminal responsibility was 15 until July 2010 (where it was sunk to 14). Denmark has no juvenile justice system: Persons aged 15 and above are sentenced in the same courts as adults and in accordance with the same criminal code (Kyvsgaard, 2004). However, most juveniles convicted of an unconditional sentence serve time in a half-way house (*pension* in Danish). Unfortunately, the central Police registers have no information about incarcerations in half-way houses before 2007. Therefore, we exclude juvenile offenders from our sample.

overlap between each pair of inmates in a facility. Our study uses a number of alternative peer definitions. We define peers as other inmates with a criminal history in offense h and: (1) from the same age group (below the age of 26); (2) from the same ethnic group (Western vs. non-Western); (3) from the same age and ethnic groups; (4) from the same age group and the same county; (5) irrespective of demographic characteristics.

We distinguish six representative types of offense: misdemeanor assault, burglary, theft, handling of stolen goods, vandalism, and drug-related offenses. For drug criminals we find strong evidence that peer exposure increases the probability of recidivism with a drug-related offense (i.e., reinforcing peer effects) when we define peers as other inmates from the same age group or from the same age and ethnic groups. By contrast, this reinforcing effect of exposure to drug offenders turns insignificant when we define peers as all other inmates irrespective of demographic characteristics. The magnitude of the reinforcing effect for drug-related crimes is sizable: A one-percentage point increase in the share of young convicts of drug-related offenses increases an individual's propensity to commit a new drug-related offense by 2.7 percentage points, if the individual has experience in drug-related offending. In other words, a standard deviation increase in the share of young inmates with a drug conviction augments the likelihood of recidivism with drugs of first-time incarcerated drug convicts' by 9 percentage points. Our findings thus partly support the view that young offenders build criminal capital behind bars due to social interactions with inmates with similar criminal history and demographic characteristics. Moreover, our results highlight the importance of defining peers appropriately to identify peer effects. From a political perspective, our findings can help design more appropriate prison assignment strategies to prevent recidivism among young drug offenders.

The rest of the paper is organized as follows. Section 2 presents information about Danish sentencing institutions. Section 3 introduces the data and depicts summary statistics. Section 4 explains the empirical model. Section 5 presents the empirical results from our baseline specification and robustness analyses. Section 6 concludes.

2. Danish Sentencing Institutions

2.1. Contemporary Prison Assignment Criteria

The assignment of criminals to sentencing institutions in Denmark is decided by The Danish Prison and Probation Service (thereafter DPPS, *Kriminalforsorgen* in Danish).[4] The decision of the DPPS depends on factors such as the sentence, the age, or the residence location and follows the Danish Sentence Enforcement Act.[5] The assignment decision is typically a two-stage decision process. First, the DPPS chooses the type of institution the offender should be sent to: an open state prison or a closed state prison.[6] By law, as a starting point, offenders with an unconditional sentence must serve time in an open state prison. Yet persons with a sentence longer than five years, with a high protection need, a high risk of evasion, or known as gang members may serve time in closed prisons, characterized by higher levels of security and monitoring.[7] Local prisons (*arresthus* in Danish) are primarily used for custody, but members of certain gangs and offenders with a short sentence may serve their entire sentence in a local prison.[8]

Second, the DPPS chooses a particular prison where to send the offender. The primary determinant is the age of the person. Offenders of age 18 or 19 are typically sent to an open prison close to their residential address, so that they can stay close to their relatives and easily remain enrolled (or become so while serving time) in education or vocational training. Offenders between 20 and 22 assigned to an open prison can go to any open institution, whereas offenders of the same age group assigned to a closed prison must serve their time at the prison of Ringe. In the decision of the particular prison, the second-most important determinant includes family needs (e.g., whether one has young children or elderly parents who need care), medical treatment needs (e.g., for drug or gambling addicts), and whether the

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[4] During interviews with the responsible unit we learned that, formally, the Police decides on the prison assignment of weapon- and violence-convicted criminals. Yet, the Police follows the guidelines of the DPPS.

[5] Available (in Danish) in Retsinformation (2013). This Act, nonetheless, leaves the DPPS with some discretionary power to consider practical issues such as bed availability.

[6] For some groups of offenders alternative sentencing forms exist. For instance, juveniles and persons with medical needs may serve their full sentence in treatment institutions, including half-way houses and offenders with a sentence of less than five months can avoid custodial serving via electronic monitoring since 2005.

[7] A few institutions (e.g., the open prisons of Kragskovhede and Møgelkær) also have half-open sections with an intermediary security level.

[8] In addition to the country's 36 local prisons, the term local prison encompasses the arrest departments in three closed state prisons (Nyborg, Vridsløselille and Østjylland). Local prisons generally apply the same rules as the closed prisons (DPPS, 2013).

person is likely to return to education or employment after release. Detailed information on each criminal offender is accessed via several documents available to the DPPS including a visitation scheme filled out at the local prison by both the personnel and the offender and the person's criminal dossier provided by the Police.[9] The third most important determinant of the choice of prison is capacity.[10] If none of the above-mentioned determinants applies, the DPPS may assign criminals in an institution according to their municipality of residence.[11]

Moreover, young inmates change institutions more often than older inmates so that they can, for instance, be closer to education or vocational training facilities in their area of residence and, thus, slowly prepare for the post-release period. Our data allow us to follow an individual across different institutions and to control for possible factors behind prison assignment such as age, level of education at time of incarceration, family situation, and municipality of residence. In the remaining text, we will use interchangeably the terms prison, institution, and facility to refer to all types of prison.

2.2. Inmates' Interactions within Facilities

Each facility houses several sections and is responsible for offender assignment to a particular section. For instance, gang members serve time in highly secured sections fully separated from the remaining sections, while juveniles serve time in juvenile sections. However, according to the DPPS the composition of sections cannot always be predetermined.

Possibilities for interactions between inmates are multiple. Except if they are placed in highly secured sections, inmates can meet across sections during the day while attending classes and workshops or exercising in the yard. Inmates usually share kitchen amenities with the rest of the section. Some open prisons have double cells. The composition of a cells varies constantly with the facilities' accurate needs, and thus cell composition is not registered. Possibilities for electronic communication are limited; inmates have access to new technologies when necessary for daytime training, but only relevant websites are accessible and mobile phones are prohibited.[12] Finally, toward the end of their sentence, young inmates

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[9] In contrast to the dossier provided by the Police, the content of the visitation form cannot be encrypted and is therefore unobserved by us. Most information in the form is relevant for inmates with incarceration history, and we choose to look only at peer effects for individuals incarcerated for the first time. A blank version of the form can be obtained from the authors.

[10] Capacity represents an increasingly important issue over the past two decades particularly due to the development of gang wars, which has led to an overcrowding of highly secured sections.

[11] Assignment according to the municipality of residence follows the DPPS internal guidelines.

[12] Yet, entrepreneurs in open prisons may get access to a computer and the internet in order to continue running their business.

typically enroll in an education program outside the prison. Young inmates then can interact with persons from other sections or from outside the facility.

3.   Data

3.1.   Primary Data Sources, Sample Construction, and Peer Measures

Our data stem from five primary sources: (1) the central Police registers on individual incarcerations in a Danish sentencing institution for the entire population, irrespective of the country of residence; (2) the central Police registers on individual crime convictions for the entire Danish population; (3) the central Police registers on individual crime charges; (4) the administrative registers, which provide individual demographic characteristics for the entire Danish population (age, marital status, number of children below age 18, current residence, country of origin, and immigrant status); and (5) the Educational Institution Register and Surveys, which provide information about individual educational attainment. All registers are available for the period 1980-2009. However, we limit our observations to the years between 1991 and 2006 for two reasons. First, the central Police registers lack information about the date of release before 1991. Second, following a reform that modified Police districts in 2007, Statistics Denmark stopped converting the coding of sentencing institutions registered by the Police, and since then institutions have been coded differently. We can link individual records from the five registers using a unique person identifier for Danish residents.

In our observation period, the central Police registers on incarcerations contain information about the date of incarceration, the date of release, the reason for incarceration, the reason for release, and the identifier of the sentencing institution. We use this information to construct facility-specific spells of incarcerations for all persons in Danish sentencing institutions. The central Police registers on crime convictions include information about the date of conviction, the verdict, the sentence, and the type of offense. We link this information to the first charge in an individual's lifetime using the central Police registers on individual charges to construct individual crime histories.

To construct our sample, we link individual records from all five registers and extract observations for offenders who were incarcerated for the first time between 1994 and 1997 at age 18 to 22. We use age 18 as the lower age limit because most juvenile offenders serve time in a half-way house, which unfortunately does not appear in the registers before 2007. Moreover, according to the DPPS, juvenile offenders who are incarcerated for the first time have most likely already committed a series of criminal activities unpunished due to their

young age; i.e., they are habitual offenders. By contrast, older first-time incarcerated offenders are not necessarily habitual offenders. Fortunately, the number of juvenile offenders who receive an unconditional prison sentence is quite low. In 2007, only 88 juveniles received an unconditional sentence compared to 1,376 offenders aged 18 to 22 (Statistics Denmark, 2012). We use age 22 as the upper age limit because this age threshold is often used in the decision on prison and prison section assignment (e.g., the prison of Ringe houses mainly men under 23, while all men in the institution of Vridsløselille are 23 or above). Moreover, to ensure that individuals are not influenced by peers from earlier incarcerations, we look only at persons incarcerated for the first time. We look at persons incarcerated from 1994, i.e., three years after the first year of observation of the release period in the central Police registers given that the Danish age of criminal responsibility is 15. We exclude individuals incarcerated after 1997 to avoid potential bias stemming from a reform voted in 1997 (*Voldspakke II*).[13] The resulting sample counts 1,928 individuals.

In addition, we construct a data set with facility-specific spells of incarceration, individual crime histories, and individual demographic characteristics for all persons serving time in a Danish sentencing institution over the 1994-2003 period.[14] This data set allows us to construct different peer measures. In our baseline specification, the peer measure (Peer measure I) is the share of inmates below the age of 26 at the time of incarceration (thereafter *young* peers) who have a criminal history with offense h weighted by the time-serving overlap with young inmates with criminal history with offense h relative to the time-serving overlap with all young inmates, irrespective of criminal history. To construct this peer measure, we first calculate for each facility j and at any date t in our observation period the share of young individuals who have a criminal history with offense h as the number of young individuals who have been convicted of offense h divided by the total number of young individuals. Next, for each individual i in our sample we construct the share of young inmates who have a criminal history with offense h by leaving out individual i's own criminal history from the calculation of the share of young individuals who have been convicted of offense h in facility

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[13] *Voldspakke II* was voted in May 1997 (law nr. 350 on 23 May 1997). To our knowledge, the only study that evaluates the causal effect of the reform on incarceration length for violent crime is Landersø (2012), who shows a significant increase by 13 percent (p10) of a 2002 change of the reform in the penal code, and no other study documents any effects of the reform before 2002. Nevertheless, as we cannot exclude that *Voldspakke II* might have increased incarceration length for violent offenses already from 1998, which might influence the incarceration length of individuals in our sample, we restrict our observations to people incarcerated before 1997. See Sections 4 and 5 for tests of our identification strategy.

[14] Criminal history and demographic characteristics are only observed for Danish residents. As some individuals in our sample are only released as late as 2003, our data set covers the 1994-2003 period.

j at date *t*. Finally, for each individual *i* in our sample we construct the share of young inmates with a criminal history with offense *h* weighted by the number of days overlap between the serving time of individual *i* and the serving time of her inmates with criminal history in offense *h* relative to the number of days overlap between the serving time of individual *i* and the serving time of inmates with criminal history in all offenses. We repeat the same technique to construct alternative peer measures defining peers according to similar criminal background and other demographic characteristics: (1) Peer measure II, inmates from the same ethnic origin (Western or non-Western); (2) Peer measure III, inmates from the same ethnic origin and below the age of 26; (3) Peer measure IV, inmates from the same county and below the age of 26; (4) Peer measure V, all other inmates irrespective of demographic characteristics.

3.2. Descriptive Statistics

Table 1 depicts some summary statistics of our main variables. 95% of individuals in our sample are males and 88% are ethnic Danes (i.e., neither immigrants nor descendants).[15] At the time of first incarceration (early 1996 on average), 10% of the individuals have children under the age of six and 0.2% are married. Moreover, 8% of the individuals in the sample have completed a vocational education degree at the time of incarceration. The average age at incarceration is almost 19.

Some individuals are transferred to another facility during their sentence and thus the overall incarceration duration of individuals consists of one or more facility-specific spells. For individuals with more than one facility-specific spell, we keep only the longest spell. The average duration of the longest facility-specific spell is 43 days.[16] Most individuals serve their longest spell in an open institution (66%), while only few serve it in a closed prison (7%) or a local prison (27%).

At the present stage we focus on six categories of offenses: misdemeanor assault (or simple violence), burglary, theft, handling of stolen goods, vandalism, and offenses against the drugs act. We choose these 6 crime categories on the basis of two selection criteria: (1) the crime category should be easily interpretable for policy purposes (unlike "other penal code

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[15] We follow the definition of Statistics Denmark. Immigrants are born abroad of parents without Danish citizenship and born outside Denmark. Descendants are born in Denmark and none of their parents are both Danish citizen and born in Denmark. The average overall share of the immigrant and descendant population in Denmark is about 7.5% in the same period (Statistics Denmark, 2012).

[16] 511 individuals in our sample serve their sentence across several institutions. For these individuals, the longest spell represents about 40% of the total duration of incarceration.

offenses" or "unknown type of crime"); and (2) the probability of recidivism with the crime category should be high enough for a precise estimation. We then disregard offense categories such as "arson" and "murder or murder attempt" with which less than one percent of the individuals in our sample recidivate. When we look at individual criminal histories, 38% of the sample have been convicted at least once for misdemeanor assault, 28% for theft, and 21% for burglary. Yet most individuals recidivate with theft (10%), burglary (9%), or drug-related offenses (6%).

Turning to peers' characteristics, we observe that most inmate fellows are males (96%), above 26 years old (70%), of Western origin (92%), Danish residents (97%), and without a vocational education degree (75%). The average number of inmates vary across facility types. While overall a prison houses daily 57 inmates, of whom 17 are below the age of 26, an open prison count 124 inmates, of whom 33 are below the age of 26. As far as peers' criminal background is concerned, we note that 12% of young peers have at least one earlier conviction for burglary, 11% for theft, 11% for misdemeanor assault, and 6% for drug-related offenses. The respective shares of peers' criminal characteristics are fairly similar across peer definitions, although misdemeanor assault is much less represented among peers defined without an age restriction (6% for Peer measures II and V).

We also have information on individuals' and peers' municipality characteristics, i.e., socioeconomic and criminal environments that may influence criminal behavior. Table 1 shows, among other things, that the average real gross income per capita is approximately DKK 200,000 (USD 34,000), the unemployment rate is 9.3%, and the overall youth crime conviction rate (after exclusion of traffic offenses) is 2.4% in the municipality of residence of individuals at the time of incarceration. The peers' average municipality unemployment rate is 9.6% and peer's average overall crime conviction rate is 2.3% at the time of incarceration.

[Table 1 about here]

4. Methodology

4.1. Studying Peer Effects

The estimation of peer effects contains several identification challenges. The most commonly applied model considers an individual outcome (Y_i) a function of individual characteristics (X_i), individual's peers' average characteristics ($\overline{X}_{-i}$), and individual's peers' average outcome ($\overline{Y}_{-i}$). This model, also known as the linear-in-means model, can formally be written as:

$$Y_i = \theta + \varphi_1 * \overline{Y}_{-i} + \omega_1 * X_i + \omega_2 * \overline{X}_{-i} + \varepsilon_i . \tag{1}$$

The work of Manski (1993) highlights the *reflection problem* that arises when studying peer effects with simple OLS regressions in Eq. (1). This issue typifies in that the outcome of each member *i* potentially affects the outcome of the rest of the group –*i* (*endogenous effect*) and, thus, reverse causality may exist between Y_i and $\overline{Y}_{-i}$ in Eq. (1). This endogenous effect may be accompanied by what Manski (1993) calls an *exogenous effect*, or the effect of average peer's characteristics. The endogenous effect and the exogenous effect make it difficult to distinguish the effect of average peers' outcome, φ_1 in Eq.(1), from the effects of average peers' characteristics, ω_2 in Eq. (1), since peers' characteristics determine peers' outcomes. An additional identification problem relates to the difficulty of eliminating potential bias from selection into the group.

4.2. Model and Identification Strategy

We introduce our empirical model by presenting how we deal with the issues just described. First, strong functional form assumptions are necessary to eliminate the reflection problem. Similarly to previous works, e.g., Bayer et al. (2009) and Corno (2012), we assume that φ_1 is zero, i.e., peer effects take place through interactions within the group only due to peers' characteristics rather than subsequent peer outcomes. Therefore, we do not include a measure of peers' average outcome ($\overline{Y}_{-i}$) on the right-hand side.

Second, we deal with possible selection into prisons by inserting facility-by-prior-offense fixed effects in our specification.[17] Such fixed effects enable us to control for the non-randomness of assignment to prisons due to criminal background and other observables and to identify the probability of recidivism from the variation in the duration of sentence-serving overlap between each pair of inmates in a facility. We include these fixed effects separately for individuals with and without prior experience in offense *h*, and thus we account for the possibility that peer effects are not linear-in-means but heterogeneous across individuals' criminal history.

For this method to be valid, first, some within-variation of peer characteristics within prisons should be observed, and this variation should be uncorrelated to individual

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[17] Similar fixed effects are used in Bayer et al. (2009). Our interviews with the DPPS have allowed us to identify the most decisive criteria, which we can observe, used to assign young offenders to a particular prison. Moreover, we have learned that young criminals were more likely to be randomly assigned to prisons in our sample period than what they are today. We show results with and without prison fixed effects alternatively (Table 4).

characteristics. Second, the validity of this method is conditional on the close-to-randomness of the timing of assignment of individuals with respect to the other inmates' characteristics. In other words, the presence of a criminal trend in our sample period would undermine the validity of our results. Although a simple test does not show strong systematic evidence of trends in criminality, we include quarter-of-release fixed effects to rule out any time trend. Furthermore, we test the first condition and show the results in Section 5. We do not find any strong correlations between our peer measures and recidivism predicted by individual and municipality characteristics once we account for facility-by-prior-offense fixed effects. This latter result supports the validity of our identification strategy.

Formally, we apply the following model as our baseline specification:

$$R_{ijt}^h = \beta_0\big(Offense_{ijt}^h * peer_{ijt}^h\big) + \beta_1\big(No\_Offense_{ijt}^h * peer_{ijt}^h\big) + \alpha P_{ijt} + \gamma X_{ijt} + \lambda_j +$$
$$Offense_{ijt}^h * \mu_j + \eta_t + \varepsilon_{ijt}^h \ . \tag{2}$$

R_{ijt}^h equals 1 if a young criminal i, first-time incarcerated in prison j, recidivates with offense h (h = 1,…,6) at date t and within 12 months after release.[18] $Offense_{ijt}^h$ is 1 if individual i has committed an offense of type h before her first incarceration, while $No\_offense_{ijt}^h$ is 1 if individual i has no recorded history of offense h.[19] The vector $peer_{ijt}^h$ measures individual i's exposure to peers with experience in offense h and below the age of 26 (Peer measure I). Alternatively, we define peers as presented at the end of Section 3, that is inmate fellows with experience in offense h and: (Peer measure II) from the same ethnic origin (Western vs. non-Western); (Peer measure III) from the same ethnic origin and below the age of 26; (Peer measure IV) from the same county and below the age of 26; (Peer measure V) irrespective of demographic characteristics. β_0 and β_1 are called the *reinforcing* peer effect and the *introductory* peer effect, respectively, and constitute the estimates of interest. P_{ijt} and X_{ijt} capture, respectively, peer and individual demographic characteristics such as age, gender, ethnicity, whether the person had completed a vocational education at the time of

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[18] The term recidivism means committing, within one year after release, an offense that will end with a conviction. Future work includes looking at a longer time span (two or three years) after release.

[19] Similar to Bayer et al. (2009), we argue that any history of crime of type h must be accounted for as opposed to the most recent crime only, as—especially young—criminals might be incarcerated not only as a result of their most recent criminal activity but also due to their entire criminal history.

incarceration,[20] and criminal histories in all types of offense h. The vector $Offense_{ijt}^h *$ μ_j captures facility-by-prior-offense fixed effects and λ_j represents prison fixed-effects. The vector η_t accounts for possible time trends and represents dummies for each quarter of release represented in our sample.

Our paper departs from Bayer et al. (2009) and uses alternative peer definitions. In a robustness test, we conduct pairwise comparisons of peer measures applying the following model to our data:

$$R_{ijt}^h = \beta_0\left(Offense_{ijt}^h * peerA_{ijt}^h\right) + \beta_1\left(No\_offense_{ijt}^h * peerA_{ijt}^h\right) + \beta_2\left(Offense_{ijt}^h * peerB_{ijt}h + \beta_3 No\_Offense_{ijt}h * peerB_{ijt}h + \alpha P_{ijt} + \gamma X_{ijt} + \lambda_j + Offense_{ijt}h * \mu_j + \eta_t + \varepsilon_{ijt}h,\right. \tag{3}$$

where the vector $peerA_{ijt}^h$ stands for Peer measure I and the vector $peerB_{ijt}^h$ represents alternatively Peer measures II to V.

5. Results

5.1. Baseline Specification

We introduce the empirical results from the baseline specification (Eq. 2) in three steps: by presenting results on specialization in crime without accounting for peer effects, by testing the validity of our identification strategy, and finally by discussing the coefficient estimates from running Eq. (2). First, in Table 2, we present the results of simple OLS regressions of an individual's probability to recidivate with a particular offense conditioning on criminal history in all types of offenses. The coefficient estimates show that having been convicted for a particular offense is positively and significantly correlated with the propensity to recidivate with the same offense. For instance, a first-time incarcerated offender with earlier convictions of burglary is 11% more likely to be convicted of burglary within one year upon first release compared to an individual with no earlier conviction of burglary (column 2). Interestingly, the average of the off-diagonal coefficients, which represent criminal history in all the other types of offense, is close to zero in all columns and always smaller than the diagonal coefficient. Table 2 shows the relevance of distinguishing peer effects by individual's conviction history in the particular crime category in Eq. (2) and (3).

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[20] Information on employment status at the time of incarceration is available to us, but we decide to disregard this variable because of its obvious endogeneity with incarceration and recidivism.

[Table 2 about here]

Second, we test our identification strategy. We identify peer effects on crime-specific recidivism from the random variation in overlap between the incarceration spells of two inmates in a facility. This variation is random if our interacted peer measures $(Offense_{ijt}^h * Peer_{ijt}^h)$ and $(No\_Offense_{ijt}^h * Peer_{ijt}^h)$ are unrelated to individual characteristics within a facility (cond. 1) and if criminal behavior of young delinquents is not influenced by any criminal trend over time (cond. 2). We account for cond. 2 by including time fixed effects (i.e., dummies for each quarter of release for each individual).[21] To deal with cond. 1, we first construct a predicted indicator for recidivism with offense *h* using individual and municipality characteristics and facility fixed effects. Then, we run a regression of the predicted indicator on the two interacted peer measures with and without facility-by-prior-offense fixed effects. Table 3 presents the results. Without facility-by-prior-offense fixed effects (Panel A), the two interacted peer measures appear significantly correlated with the characteristics used to construct the predicted indicator of recidivism, although the coefficients are small. Hence, using across-facility variation our interacted peer measures associate with individual attributes behind recidivism in each crime category, which likely also determine prison assignment.

When we add facility-by-prior-offense fixed effects (Panel B) and thus use only within-facility variation in peer measures, the significance of the interacted peer measures disappears. Although one out of twelve coefficients turns significant (*burglary*, column 8), all coefficients are very close to zero. Therefore, peer measures and individual characteristics are not related within a facility when we add facility-by-prior-offense fixed effects to the model. As a result, these fixed effects allow us to identify peer effects from the random variation in time-serving overlap between two inmates in a facility.

[Table 3 about here]

Table 4 presents the main empirical results when we apply different sets of controls. In Panel A, we report the correlations between peer measures and crime-specific recidivism using Control set 1: the two interacted peer measures, the share of peers with criminal background in each of the other five offenses, and indicators for having a criminal history in each of the six offense categories. Virtually all estimated correlations in Panel A are insignificant, although the correlation between the share of peers with a drug-related offense and recidivism

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[21] Alternatively, we use a dummy for each quarter of incarceration. Results (not shown here) are very similar.

with a drug-related offense is rather large in magnitude (column 6, Panel A). In Panel B, we report estimated correlations using Control set 2: Control set 1, other individuals characteristics, characteristics of municipality of residence at the time of incarceration, demographic characteristics of peers and time and prison fixed effects. The estimated correlation between the share of peers with a history in drug-related offending and individual recidivism with drug-related offending increases in magnitude and turns significant at a 5-percent significance level (column 6, Panel B). Finally, we estimate the causal effects of peer exposure on crime-specific recidivism using Control set 3: Control set 2 and facility-by-prior-offense fixed effects. The results are reported in Panel C. Two estimates of peer effects are significant: the reinforcing peer effect on recidivism with a drug-related offense of 2.7 percentage points (significant at a 1-percent level) and the introductory but negative peer effect on recidivism with misdemeanor assault (significant at a 5-percent level).[22] Also notice that the coefficient estimates in Panel B are overall very close to the estimates in Panel C, suggesting that non-randomness of offenders' assignment to a particular prison and time-serving overlap between two inmates may not be a critical issue in our sample.[23]

To sum up, in Table 4, we find significant evidence that young drug-criminals strengthen criminal capital behind bars, increasing the probability of recidivism in drug-related offenses. A way to interpret our finding is to see by how much the propensity to commit new drug crime varies for drug convicts due to peer effects in prison. To do so one can compare the estimates in Table 4 (i.e., recidivism due to peer effects) to the numbers in Table 2 (i.e., individual propensity to specialize in crime irrespective of peer effects). A standard deviation increase in the number of inmates under the age of 26 with drug-related criminal background (3.4) increases the likelihood of recidivism with drugs for individuals with a background in drugs from 17% (Table 2) to 26% (Table 4), i.e., by 9 percentage points.

[Table 4 about here]

5.2. Robustness and Sensitivity Analyses

Next, we test whether peer effects vary with the definition of peers to investigate if interactions take place more often among individuals not only from the same age group but also from the same ethnic group or from the same residential area. Table 5 presents the results

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[22] Table A2 in the Appendix displays estimates for all control variables included in the model in Control set 3 in Table 4.

[23] We estimate Eq. (2) with the same set of controls as in Control set 2 simultaneously for ten crime-specific recidivism indicators instead of the six crime-specific recidivism indicators in Table 4. Results are shown with all control variables in Table A7. We still find reinforcing peer effects only on drug-related recidivism.

when we change the definition of peers and use Peer measures II to V. All specifications in Table 5 include the full set of control variables and facility-by-prior-offense fixed effects.[24] Using peer measure II (Panel A), other inmates from the same ethnic group (Western or non-Western origin), we do not find any significant peer effects on crime-specific recidivism.

Using peer measure III (Panel B), other inmates from the same ethnic group and below 26 years old, we find evidence of reinforcing peer effects on drug-related offenses (estimate of 2.1 percentage points in column 6) of a magnitude similar to that of the estimate in Table 4 (estimate of 2.7 percentage points, column 6, Panel C, Table 4), but less precisely estimated. Moreover, in contrast to the findings in Table 4, we now find negative but small estimates of introductory peer effects on vandalism and drug-related offenses (estimates of 0.3 and 0.4 percentage point, columns 5 and 6, respectively, Panel B, Table 5). The later results suggest that exposure to peers with a criminal history in vandalism (drug-related crimes) decreases the probability of recidivism with vandalism (drug-related crimes) for individuals without experience in vandalism (drug-related crimes).

Using peer measure IV, young inmates from the same county of residence, we do not find any statistical evidence of peer effects (Panel C).

Similarly, using peer measure V, all inmates irrespective of demographic characteristics (Panel D), we do not find any significant positive crime-specific peer effects. Nevertheless, we find a negative reinforcing peer effect on recidivism with misdemeanor assault and negative introductory peer effects on recidivism with theft and vandalism. The statistically significant peer effects in Panel D might suggest that older inmates with past experience in one of these three offenses discourage young offenders to recidivate with these two offenses. Recall, however, that peer effects on recidivism with theft and vandalism are insignificant when we use our preferred peer measure (Peer measure I or inmates below the age of 26) in Table 4.

[Table 5 about here]

To be able to conclude more clearly on which peer definition best characterizes social interactions of inmates, we propose to compare pairwise peer effects from different peer groups in the same econometric specification. Tables 4 and 5 show evidence of reinforcing

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[24] See in the Appendix Tables A3, A4, A5, and A6 for the validity test of our identification strategy (similar to the test presented in Table 3) when defining peers as inmates from the same ethnic origin (Western vs. non-Western), as inmates from the same ethnic origin and below the age of 26, as inmates from the same county and below the age of 26, and as inmates irrespective of age or ethnicity, respectively.

peer effect on drug-related recidivism, when defining peers according to Peer measures I (young inmates) and III (young inmates of the same ethnic origin), respectively. In Table 6, we present estimates when applying Eq. (3) and control for two sets of peer measure simultaneously. Panel A of Table 6 reports estimates when both Peer measures I and III are included in the model. The estimate of the reinforcing peer effect on recidivism with a drug-related offense using Peer measure I is of similar magnitude as the baseline estimate in Table 4, whereas the reinforcing peer effect on recidivism with a drug-related offense using Peer measure III approaches zero. Moreover, a simple post estimation test rejects the null-hypothesis that both reinforcing peer effects in Panel A (column 6) are statistically insignificant at a 5-percent level. Taken together these findings suggest that Peer measure I captures social interactions of young inmates better than Peer measure III and that reinforcing peer effects exist for recidivism with drug-related offending.

In Panel B of Table 6, we report the estimated peer effects when using Peer measure I (young inmates) and Peer measure V (all inmates). By including both Peer measures I and V in the model, we can distinguish peer effects from young inmates from peer effects from older inmates. Comparing peer effects from young and older inmates is relevant, particularly in terms of transmission of criminal capital along two opposing hypotheses. First, novice criminals may learn from older and confirmed offenders behind the bars. Second, a young inmate may become discouraged to commit new criminality when exposed to older inmates with similar criminal records as the young inmate realizes that he, similarly to older inmates, may end up having a life punctuated by frequent prison stays. In other words, exposure to older inmates with a similar criminal background may exacerbate the criminality deterrence effect of a prison stay. The estimates in Panel B appear to corroborate the later hypothesis. Indeed, we find evidence of a significant and negative reinforcing effect on recidivism with misdemeanor assault due to exposure to older inmates convicted of misdemeanor assault (-2.4 percentage points, column 1, Panel B). According to this estimate a standard deviation increase in the share of inmates earlier convicted of simple violence reduces the likelihood of reiterating with simple violence from 6.4% to 3.1%. In addition, our finding of a significant and positive reinforcing peer effect for drug-related offenses due to exposure to other young inmates reported in Table 4 (column 6, Panel C) is robust to the inclusion of Peer measure V in Table 6 (column 6, Panel B). In fact, the point estimate increases slightly (3.2 percentage points) in Table 6.

Panel C of Table 6 reports estimated peer effects when we include Peer measure I (young inmates) and Peer measure IV (young inmates from the same county). The positive

and significant reinforcing effect on recidivism with a drug-related crime reported in Table 4 (column 6, Panel C) is robust to the inclusion of Peer measure IV. In fact, the point estimate in Table 6 (column 6, Panel C) increases somewhat (4.2 percentage points). The reason is that the estimate of the reinforcing peer effect for drug-related offenses due to peers under the age of 26 from the same county is negative and significant in Table 6 (-2.1 percentage points) in the same column. Thus, surprisingly, serving time with other young drug offenders from the same county appears to dissuade young drug offenders from recidivism with drug-related offenses. However, this finding should be interpreted with caution since no such result is found in Table 5 (Panel C).

[Table 6 about here]

We draw three main conclusions from our findings in Tables 4, 5, and 6. First, our finding of a positive reinforcing peer effect on recidivism with drug-related offending reported in Table 4 (Panel C) is robust to the inclusion of alternative peer measures in Tables 5 and 6. This robustness suggests that the peer measure that best captures social interactions in Danish prisons is Peer measure I, inmates under the age of 26 irrespective of ethnic origin and county of residence. The alternative peer measures are either too narrow (Peer measures II, III and IV) or too broad (Peer measure V). Second, we find little evidence of reinforcing and introductory peer effects for the five other types of offenses (misdemeanor assault, burglary, theft, handling of stolen goods, vandalism). Nevertheless, a third conclusion is that exposure to older inmates with the same criminal background may prevent young inmates from continuing down the criminal path as shown in Table 6, Panel B. At least we find robust evidence of such a protective peer effect for misdemeanor assault. This finding may partly reflect the implementation of proper training and treatment programs, such as anger management programs, that seem to be successful in reducing simple violence crimes also via learning peer effects.

The significant result for recidivism with offenses related to drugs may reveal the presence and, of greater concern, the development of networks involving drugs in prisons. If this is true, we would expect stronger peer effects in institutions where inmates have a greater opportunity to interact. In our data, we can distinguish three types of institution: closed state prison, open state prison, and local prison. Closed prisons are characterized by the highest level of monitoring and security, little possibility for bringing illegal objects in the institution, and fewer social interactions across the prison's sections. By contrast, inmates in open

prisons typically move more freely within the institution and sometimes participate in daytime activities outside the facility. Local prisons' main purpose is to house individuals in custody, but offenders in our sample may get to serve their whole sentence in a local prison if, for instance, their sentence does not exceed the number of days already spent in custody. Rules about security and monitoring in local and closed prisons are alike in many cases (DPPS, 2013). However, talking with the DPPS, we have learned that local prisons do not always have the resources to apply all rules. For instance, inmates and visitors in non-highly secured sections might not systematically get checked upon entry and the offer of training and treatment preparing for reinsertion is often more modest in local prisons. As a result, inmates are more likely to possess illegal objects facilitating continued drug operations and to interact with other inmates off training hours in local prisons than in closed prisons.

Given these differences, in another test we investigate whether peer effects vary by facility type. Due to the obvious possibility of selection on unobservables into a particular type of facility, we use interacted terms between our two peer measures and the facility type instead of running regressions separately for each facility type. We report our results in Table 7 where the peer definition refers to inmates under the age of 26.

In Table 7 we do not find evidence of difference in peer effects across facility types. The specification for drug-related offenses (column 5) shows the same coefficient as in Table 4, 2.7 percentage points, and we do not find any statistical estimate for any of the interaction terms. Moreover, interestingly, we find statistical evidence that incarceration in a closed prison reduces recidivism with burglary and that serving time in a local prison decreases the likelihood to commit vandalism.

[Table 7 about here]

All in all, our most robust finding suggests that inmate fellows below the age of 26 convicted of drug-related crime influence first-time incarcerated young drug convicts in recidivating with drug-related offenses.

Our findings are partly in line with those of Bayer et al. (2009), who provide strong evidence of reinforcing peer effects among juveniles in Florida (USA) for several offenses including offenses related to drugs. At first sight, the Bayer et al. (2009) point estimate of reinforcing peer effects for drug-related offending is significantly smaller than ours (0.31 vs. 2.7). Yet, the dissimilarity between the estimates of the two studies becomes substantially smaller if we compare changes in recidivism probability due to a standard deviation increase: 3 percentage points in Bayer et al. (2009) against 9 percentage points in our study. A major

difference between our study and the Bayer et al. (2009) study is the simple probability of specialization in drugs depicted in Table 2: It is much higher in Bayer et al. (2009) (29%) than in our study (17%). One has to keep in mind that the two papers look at two different populations—juveniles vs. young adults—and depart from two different contexts. Thus, labor market, educational, and criminal opportunities are likely to differ between the two countries. In addition, previous studies have shown that juveniles have a higher likelihood to commit crime than adults for at least two reasons. First, they lack maturity to reflect on the consequences of crime (Moffitt, 1993; Pichler and Romer, 2011). Second, they tend to experience a lower employment penalty than older offenders as employers consider juveniles relatively less culpable when committing crime (Mears et al., 2007). Furthermore, Danish and Floridian institutions remain hardly comparable if they differ in terms of monitoring practices, trainings, treatment programs, and so forth during incarceration.

6.   Conclusion

In this paper, we use Danish criminal and administrative registers to investigate peer effects on crime-specific recidivism among offenders incarcerated for the first time at age 18 to 22. Similar to Bayer et al. (2009), we deal with selection and possible time trends in criminal activity by including facility-by-prior-offense fixed effects and quarter-of-release fixed effects. We thus identify peer effects from the random variation in time-serving overlap between each pair of inmates in a facility. We define peers alternatively as other inmates with a criminal history in offense h and: (1) under the age of 26, (2) from the same ethnic group, (3) under the age of 26 and from the same ethnic group, (4) under the age of 26 and from the same county, and (5) irrespective of any demographic characteristics.

We provide robust evidence that drug convicts' exposure to other young drug convicts in prison increases their probability of recidivism with drug crimes (i.e., a reinforcing peer effect for drug-related crime). Our preferred estimate shows that a percentage increase in the share of young convicts of drug-related offenses increases an individual's propensity to commit a new drug-related offense by 2.7 percentage points if the individual has past experience with drug-related offending—or by 9 percentage points for a standard deviation increase. This reinforcing peer remains across all types of facility: local, open, and closed prisons. In addition, we find little evidence of peer effects on recidivism with simple violence, burglary, theft, handling of stolen goods, or vandalism. Our findings partly differ from those of Bayer et al. (2009) since they find evidence of peer effects not only on drug-related

offenses, but also on violent offenses and property crimes. The difference of our findings may arise from the two distinct populations (juveniles vs. first-time incarcerated young adults) and institutional dissimilarities such as the extent of training programs in prisons, educational and labor market opportunities upon release, or(and)—on the other end of the spectrum—different criminal opportunities.

Moreover, our results highlight that the definition of peers is of key importance for investigating the existence of peer effects in prisons. More explicitly, we find little evidence of peer effects in prisons when defining peers as all other inmates irrespective of demographic characteristics such as age. We interpret our results as evidence of social interactions among inmates in the same age group. The main policy implication of our findings is that grouping inmates convicted of drug-related crime by age is not optimal as it increases the probability to recidivate with drug-related crime. Furthermore, no evidence of peer effects for other types of offenses than drugs may reflect the effectiveness of training programs offered during incarceration, such as anger management programs for violent offenders, in reducing peer effects on crime.

Future extensions of this paper include digging into drug convicts' *criminal career* to shed light on, among others, individuals and their peers' criminal record pre- and post-incarceration and the possible development of networks among former co-inmates that are also drug-related offenders. An additional development of this paper will be to connect person and case identifiers available in the central Police registers to assess whether individuals in our sample recidivate jointly with former inmates. Our study will increase knowledge about the early steps of a criminal career and the formation of social networks in sentencing facilities.

7.   References

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8. List of Tables

Table 1: Summary statistics

	Mean	Std. Dev.	
		Overall	Within
Recidivism rates (at least once within 12 months upon first release)			
Overall	0.532	0.50	0.48
Misdemeanor assault	0.059	0.23	0.23
Burglary	0.091	0.29	0.28
Theft	0.104	0.30	0.29
Stolen goods (handling)	0.023	0.15	0.15
Vandalism	0.030	0.17	0.16
Drug-related offense	0.064	0.24	0.24
Other offenses	0.358	0.48	0.47
Socioeconomic characteristics in the year of incarceration			
Male	0.951	0.22	0.19
Ethnic Dane	0.879	0.33	0.32
Married	0.002	0.04	0.04
Has at least one child under 6	0.096	0.29	0.29
Year	1996	0.89	0.87
Age	18.93	0.91	0.89
Has a vocational education degree	0.008	0.09	0.09
Incarceration conditions			
Duration (of the longest spell) in days	43.17	105.31	94.70
Closed prison	0.074	0.26	0
of which Copenhagen prison	0.060	0.24	0
Open prison	0.657	0.47	0
Local prison	0.269	0.44	0
Criminal behavior before first incarceration (1 if at least one conviction in offense h)			
Misdemeanor assault	0.384	0.49	0.47
Burglary	0.212	0.41	0.40
Theft	0.276	0.45	0.44
Stolen goods (handling)	0.061	0.24	0.24
Vandalism	0.131	0.34	0.33
Drug-related offense	0.108	0.31	0.30
Other offenses	0.744	0.44	0.43
Peer measure I: share (in%) of peers under the age of 26 (weighted averages) with criminal history characteristics in			
Misdemeanor assault	10.79	5.74	4.48
Burglary	11.71	5.39	4.15
Theft	11.04	4.05	3.34
Stolen goods (handling)	3.281	2.40	2.15
Vandalism	4.931	2.85	2.44
Drug-related offense	6.034	3.40	2.78
Other offenses	52.22	7.40	6.21

	Mean	Std. Dev.	
		Overall	Within

Peer measure II: share (in%) of peers of the same ethnic origin (weighted averages) with criminal history characteristics in

	Mean	Overall	Within
Misdemeanor assault	5.962	3.68	3.43
Burglary	9.078	3.44	2.59
Theft	10.81	2.84	2.54
Stolen goods (handling)	3.999	2.10	1.91
Vandalism	4.137	1.95	1.84
Drug-related offense	6.420	2.71	2.22
Other offenses	59.39	6.78	5.40

Peer measure III: share (in%) of peers of the same ethnic origin and under the age of 26 (weighted averages) with criminal history characteristics in

	Mean	Overall	Within
Misdemeanor assault	11.23	8.37	7.47
Burglary	11.40	6.46	5.51
Theft	10.93	5.29	4.83
Stolen goods (handling)	3.270	3.38	3.16
Vandalism	4.815	3.40	3.09
Drug-related offense	5.971	4.56	4.12
Other offenses	51.92	10.48	9.49

Peer measure IV: share (in%) of peers living in the same county prior to incarceration and under the age of 26 (weighted averages) with criminal history characteristics in

	Mean	Overall	Within
Misdemeanor assault	11.00	12.92	11.94
Burglary	10.39	11.27	10.37
Theft	9.89	8.85	8.48
Stolen goods (handling)	2.74	4.06	3.89
Vandalism	4.34	5.67	5.42
Drug-related offense	4.97	5.97	5.64
Other offenses	46.92	21.62	20.46

Peer measure V: Share (in%) of all peers (weighted averages) with criminal history characteristics in

	Mean	Overall	Within
Misdemeanor assault	5.644	1.98	1.59
Burglary	9.209	2.68	1.49
Theft	10.63	1.79	1.35
Stolen goods (handling)	3.987	1.28	1.04
Vandalism	4.171	1.31	1.13
Drug-related offense	6.394	1.98	1.31
Other offenses	59.96	4.72	2.97

Individual characteristics of the municipality of residence in the year of incarceration (averages)

	Mean	Overall	Within
Real gross income in DKK	206,027	17,836	16,790
Unemployment rate	9.286	2.68	2.47
Share of population of non-Western origin	4.257	3.59	3.13
Gini coefficient	0.263	0.02	0.02
Overall youth crime conviction rate	2.386	0.73	0.63
Crime detection rate	19.95	4.02	3.82
Reported crimes per capita	10.78	4.42	4.06
Reported violent crimes per 10,000 inhabitants	0.276	0.12	0.11

	Mean	Std. Dev.	
		Overall	Within
Number of police officers per 1,000 inhabitants	1.610	0.90	0.78
Labor market participation rate	77.43	3.04	2.89
Number of pupils per class	19.12	1.62	1.46
Peer characteristics (general definition) at the time of incarceration			
Share of male inmates	0.959	0.10	0.02
Share of inmates below the age of 26	0.301	0.10	0.06
Share of inmates of non-Western origin	0.078	0.06	0.03
Share of inmates non-Danish residents	0.027	0.07	0.03
Share of inmates with a vocational education degree	0.255	0.09	0.04
Unemployment rate in the peer's municipality of residence (weighted average)	9.591	1.60	1.26
Overall youth crime conviction rate in the peer's municipality of residence (weighted average)	2.342	0.35	0.10
Other peer characteristics (not controlled for in the specifications)			
Average daily number of inmates in a facility	57		
Average daily number of inmates under the age of 26 in a facility	17		
Average daily number of inmates in a closed prison	69		
Average daily number of inmates under the age of 26 in a closed prison	30		
Average daily number of inmates in an open prison	124		
Average daily number of inmates under the age of 26 in an open prison	33		
Average daily number of inmates in a local prison	51		
Average daily number of inmates under the age of 26 in a local prison	18		
Observations	1.928		

Notes: own calculations based on our sample of young inmates incarcerated for the first time between 1994 and 1997 at the age of 18 to 22. See the main text for more information on the data.

Table 2: Specialization in crime

	Dep. var.: Indicator for recidivism with					
	Misd. assault (1)	**Burglary** (2)	**Theft** (3)	**Stolen goods** (4)	**Vandalism** (5)	**Drugs** (6)
Prior offense	0.064**	0.114**	0.084**	0.018	0.027*	0.110**
	(0.012)	(0.024)	(0.021)	(0.018)	(0.010)	(0.025)
No prior offense (aver. of off-diagonal coefficients)	0.006	-0.009	-0.007	0.012	0.003	0.002
Constant	0.015	0.115**	0.128**	0.005	0.040**	0.056**
	(0.008)	(0.020)	(0.027)	(0.011)	(0.012)	(0.018)
R-squared	0.021	0.057	0.038	0.010	0.011	0.032
Observations			1,928			

Notes: OLS estimations of the propensity to recidivate (i.e., be convicted at least once within the year following the first release) on crime history (i.e., convicted at least once). "Prior offense" represents the offense stated in the head of each column. Each specification includes controls for criminal history in all types of offenses. Robust standard errors clustered at the facility level are in parentheses. **: $p<0.01$, *: $p<0.05$.

Table 3: Predicted recidivism on the relevant peer measure (peers under the age of 26)

	Dependent variable: Indicator for predicted recidivism with											
	Misd. assault	Burglary	Theft	Stolen goods	Vandalism	Drugs	Misd. Assault	Burglary	Theft	Stolen goods	Vandalism	Drugs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OffenseXpeers_h	0.003**	0.012**	0.009**	0.003**	0.003**	0.014**	-0.001	0.000	0.001	0.004	-0.001	-0.003
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
No_offenseXpeers_h	-0.001*	0.002	0.001	-0.001	-0.001	-0.000	0.001	0.003**	0.001	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Facility-by-prior-offense fixed effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
R-squared	0.065	0.186	0.095	0.003	0.011	0.109	0.322	0.496	0.424	0.305	0.286	0.368
Observations	1,928						1,928					

Notes: The dependent variable is recidivism (in h offense) predicted using individual and municipality characteristics, including municipality dummies, in the year of incarceration and facility fixed effects. We exclude municipality characteristics that present high multicollinearity from the set of regressors. Predicted recidivism is then regressed only on the interacted peer measures relevant for each offense (in the head of each column) and facility-by-prior-offense fixed effects in columns (7) to (12). Each column represents a different specification. For instance, offense h in the two peer measures in columns (1) and (7) is misdemeanor assault. Specifications (1) to (12) are simultaneously estimated as a SUR. Robust standard errors clustered at the facility level are in parentheses. **: $p<0.01$, *: $p<0.05$.

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Table 4: Crime-specific peer effects on recidivism (Peer measure I: inmates under the age of 26)

	Panel A; Control set 1						Panel B; Control set 2						Panel C; Control set 3					
	Dependent variable: Indicator for recidivism with misd. assault (1), burglary (2), theft (3), stolen goods (4), vandalism (5), drugs (6)																	
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
OffenseXpeers_h (β_0)	-0.001	0.008	0.009	-0.014	-0.002	0.017	-0.003	0.005	0.007	-0.010	-0.000	0.021*	0.001	0.006	-0.002	-0.021	-0.005	0.027**
	(0.002)	(0.005)	(0.005)	(0.007)	(0.002)	(0.009)	(0.002)	(0.005)	(0.006)	(0.006)	(0.003)	(0.009)	(0.003)	(0.006)	(0.006)	(0.015)	(0.004)	(0.010)
No_offenseXpeers_h (β_1)	0.000	0.000	0.001	-0.000	-0.002*	-0.001	-0.002	-0.003	0.001	0.000	-0.002	-0.002	-0.004*	-0.002	-0.003	-0.001	-0.003	-0.000
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Individ. charact.	Restrict						YES						YES					
Municipality charact.	NO						YES						YES					
Peer characteristics	NO						YES						YES					
Time fixed effects	NO						YES						YES					
Facility fixed effects	NO						YES						YES					
Facility-by-prior-offense fixed effects	NO						NO						YES					
R-squared	0.024	0.065	0.047	0.019	0.010	0.051	0.201	0.217	0.233	0.173	0.237	0.207	0.319	0.386	0.410	0.345	0.363	0.353
Observations	1,928						1,928						1,928					

Notes: Each column represents a different specification. For instance, offense h in the two peer measures for columns (1) is misd. assault. In this table, peers are defined as other inmates below the age of 26. "Restrict" refers to a set of controls for individual characteristics restricted to criminal history in all offense categories and the measures of peer shares not interacted with crime. "Individ. charact." refers to the complete set of controls for individual characteristics including criminal history, not interacted peer measures for off-diagonal offenses, and socioeconomic variables. "Municipality charact." refers to a set of controls for the individual's municipality (at the time of incarceration) characteristics and municipality dummies. "Peer characteristics" refers to controls for share of inmates in particular demographic groups: under the age of 26, of non-Western origin, non-Danish residents, male, who have completed vocational education degree; and to controls for peer municipality characteristics such as average unemployment rate and average youth crime conviction rate. See Table A2 in the Appendix for the estimated coefficients of all control variables with the same specifications. All specifications are simultaneously estimated as a SUR. Robust standard errors clustered at the facility level are in parentheses. **: p<0.01, *: p<0.05.

Table 5: Crime-specific peer effects on recidivism: several definitions of peers

Dependent variable: Indicator for recidivism with misd. assault (1), burglary (2), theft (3), stolen goods (4), vandalism (5), drugs (6)

	Panel A						Panel B					
	Peer measure II: inmates of same ethnic origin						**Peer measure III: inmates of same ethnic origin & under 26**					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
OffenseXpeers_h (β_0)	-0.002	0.003	-0.001	-0.003	0.009	0.020	0.002	0.003	0.003	-0.011	-0.002	0.021*
	(0.003)	(0.009)	(0.005)	(0.012)	(0.008)	(0.018)	(0.001)	(0.005)	(0.003)	(0.009)	(0.003)	(0.010)
No_offenseXpeers_h (β_1)	-0.001	-0.004	0.004	0.002	-0.003	-0.004	-0.001	-0.000	0.002	0.003	-0.004**	-0.003*
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)
Individ. charact.			YES						YES			
Municipality charact.			YES						YES			
Peer characteristics			YES						YES			
Time fixed effects			YES						YES			
Facility-by-prior-offense fixed effects			YES						YES			
R-squared	0.314	0.384	0.408	0.342	0.356	0.346	0.320	0.383	0.411	0.345	0.359	0.351
Observations			1,928						1,928			

Dependent variable: Indicator for recidivism with misd. assault (1), burglary (2), theft (3), stolen goods (4), vandalism (5), drugs (6)

	Panel C						Panel D					
	Peer measure IV: inmates from the same county & under 26						**Peer measure V: all inmates**					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
OffenseXpeers_h (β_0)	-0.000	0.002	-0.003	-0.010	0.001	-0.011	-0.017*	-0.002	-0.001	-0.014	0.011	0.011
	(0.001)	(0.002)	(0.002)	(0.006)	(0.002)	(0.007)	(0.007)	(0.015)	(0.013)	(0.024)	(0.016)	(0.021)
No_offenseXpeers_h (β_1)	-0.000	0.000	0.001	-0.000	-0.001	0.001	-0.005	-0.006	-0.015*	0.001	-0.009*	-0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.006)	(0.007)	(0.003)	(0.004)	(0.005)
Individ. charact.			YES						YES			
Municipality charact.			YES						YES			
Peer characteristics			YES						YES			
Time fixed effects			YES						YES			
Facility-by-prior-offense fixed effects			YES						YES			
R-squared	0.316	0.383	0.407	0.341	0.361	0.343	0.320	0.383	0.409	0.341	0.358	0.342
Observations			1,928						1,928			

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Notes: Each column represents a different specification. For instance, offense h in the two peer measures for columns (1) is misd. assault. In this table, peers are defined alternatively as other inmates from the same ethnic origin—Western vs. non-Western—(Peer measure II), other inmates below the age of 26 and from the same ethnic origin (Peer measure III), other inmates below the age of 26 and from the same residence county at the time of incarceration (Peer measure IV), and all inmates in general (Peer measure V). "Individ. charact." refers to the complete set of controls for individual characteristics including criminal history, not interacted peer measures for off-diagonal offenses, and socioeconomic variables. "Municipality charact." refers to a set of controls for the individual's municipality (at the time of incarceration) characteristics and municipality dummies. "Peer characteristics" refers to controls for share of inmates in particular demographic groups: under the age of 26, of non-Western origin, non-Danish residents, male, who have completed vocational education degree; and to controls for peer municipality characteristics such as average unemployment rate and average youth crime conviction rate. All specifications are simultaneously estimated as a SUR and include facility fixed effects. Robust standard errors clustered at the facility level are in parentheses. **: $p<0.01$, *: $p<0.05$.

Table 6: Crime-specific peer effects on recidivism. Comparing peer groups

Dependent variable: Indicator for recidivism with misd. assault (1), burglary (2), theft (3), stolen goods (4), vandalism (5), drugs (6)

	Panel A						Panel B						Panel C					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
OffenseXyoung peers_h (β_0)	-0.000	0.009	-0.006	-0.025	-0.009	0.022	0.005	0.011	-0.005	-0.024*	-0.009*	0.032**	0.001	0.005	0.000	-0.019	-0.010**	0.042**
	(0.003)	(0.012)	(0.007)	(0.017)	(0.006)	(0.019)	(0.004)	(0.008)	(0.007)	(0.012)	(0.004)	(0.012)	(0.003)	(0.006)	(0.006)	(0.014)	(0.004)	(0.010)
No_offenseXyoung peers_h (β_1)	-0.003	-0.004	-0.008*	-0.007	-0.000	0.005	-0.004*	-0.001	0.000	-0.001	-0.002	0.000	-0.005*	-0.003	-0.004	-0.001	-0.003	-0.001
	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)
OffenseXyoung own ethnic peers_h (β_2)	0.001	-0.003	0.005	0.003	0.004	0.007												
	(0.001)	(0.010)	(0.003)	(0.009)	(0.005)	(0.017)												
No_offenseXyoung own ethnic peers_h (β_3)	-0.001	0.002	0.006	0.005	-0.003	-0.004**												
	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)												
OffenseXoverall peers_h (β_2)							-0.024**	-0.020	0.009	0.007	0.023	-0.021						
							(0.009)	(0.021)	(0.017)	(0.022)	(0.018)	(0.025)						
No_offenseXoverall peers_h (β_3)							0.001	-0.008	-0.013	0.004	-0.007	-0.003						
							(0.005)	(0.006)	(0.007)	(0.004)	(0.004)	(0.005)						
OffenseXyoung own county peers_h (β_2)													-0.000	0.001	-0.003	-0.008	0.003	-0.021**
													(0.001)	(0.002)	(0.003)	(0.006)	(0.003)	(0.006)
No_offenseXyoung own county peers_h (β_3)													0.001	0.001	0.002	0.000	-0.001	0.001
													(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Individ. charact			YES						YES						YES			
Municip. charact.			YES						YES						YES			
Peer characteristics			YES						YES						YES			
Time fixed effects			YES						YES						YES			
F-P-O fixed effects			YES						YES						YES			
R-squared	0.322	0.388	0.417	0.350	0.366	0.358	0.326	0.388	0.414	0.348	0.366	0.354	0.321	0.388	0.413	0.348	0.371	0.363

$H_0: \beta_0 = \beta_2 = 0$ for drug-related offenses (column 6)
Panel A: p = 0.0202
Panel B: p = 0.0215
Panel C: p = 0.0000

| Observations | 1,928 | | | | | | 1,928 | | | | | | 1,928 | | | | | |

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Notes: Each column represents a different specification. For instance, offense h in the two peer measures for columns (1) is misd. assault. "Young peers" stands for peers under the age of 26 (Peer measure I in Table 4); "young own ethnic peers" stands for peers under the age of 26 and of the same ethnic origin (Western or non-Western) (Peer measure III in Table 5); "overall peers" refers to peer irrespective of their demographic groups (Peer measure V in Table 5); "young own county peers" refers to peers residing in the same county and under the age of 26 (Peer measure IV in Table 5). "Individ. charact." refers to the complete set of controls for individual characteristics including criminal history, not interacted peer measures for off-diagonal offenses, and socioeconomic variables. "Municip. charact." refers to a set of controls for the individual's municipality (at the time of incarceration) characteristics and municipality dummies. "Peer characteristics" refers to controls for share of inmates in particular demographic groups: under the age of 26, of non-Western origin, non-Danish residents, male, who have completed vocational education degree and to controls for peer municipality characteristics such as average unemployment rate and average youth crime conviction rate. "F-P-O fixed effects" refers to a set of interacted fixed effects for facility and criminal background fixed effects. All specifications are simultaneously estimated as a SUR and include facility fixed effects. Robust standard errors clustered at the facility level are in parentheses. **: p<0.01, *: p<0.05.

Table 7: Crime-specific peer effects on recidivism: the role of facility type

	Misd. assault	Burglary	Theft	Vandalism	Drugs
			Dep. variable: indicator for recidivism with:		
	(1)	(2)	(3)	(4)	(5)
OffenseXpeers_h (β_0)	0.001	0.011	0.018	-0.006	0.027*
	(0.004)	(0.009)	(0.012)	(0.006)	(0.014)
No_offenseXpeers_h (β_1)	-0.002	-0.005	0.002	-0.004	0.005
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)
OffenseXpeers_hXclosed	0.028	-0.007	-0.033	0.030	0.058
	(0.015)	(0.045)	(0.018)	(0.049)	(0.036)
No_offenseXpeers_hXclosed	-0.009	0.027	-0.003	0.009	-0.028
	(0.012)	(0.014)	(0.011)	(0.007)	(0.018)
OffenseXpeers_hXlocal	-0.000	-0.016	-0.025	0.005	-0.013
	(0.007)	(0.012)	(0.014)	(0.007)	(0.018)
No_offenseXpeers_hXlocal	-0.001	0.003	-0.008	0.001	-0.007
	(0.003)	(0.004)	(0.005)	(0.004)	(0.004)
Closed prison	-0.018	-0.683*	0.129	0.037	0.273
	(0.168)	(0.276)	(0.189)	(0.063)	(0.178)
Local prison	0.109	-0.162	0.124	-0.212**	0.138
	(0.158)	(0.226)	(0.130)	(0.074)	(0.179)
Open prison			Ref.		
Individ. charact.			YES		
Municip. charact.			YES		
Peer characteristics			YES		
Time fixed effects			YES		
Facility-by-prior-offense fixed effects			YES		
R-squared	0.517	0.369	0.389	0.339	0.343
Observations			1,928		

Notes: Each column represents a different specification. For instance, offense *h* in the two peer measures for column (1) is misd. assault. In this table, peers are defined as other inmates below the age of 26. Note that it was not possible to include more than five types of offense in Table 7 without further restrictions on the model. We then remove the offense that is the least committed with recidivism: handling stolen goods. "*OffenseXpeers_hXclosed*" and "*No_offenseXpeers_hXclosed*" refer to the interacted peer measures for those who serve time in a closed prison. "*OffenseXpeers_hXlocal*" and "*No_offenseXpeers_hXlocal*" refer to the interacted peer measures for those who serve time in a local prison. The reference type of facility is open prison. "Individ. charact." refers to the complete set of controls for individual characteristics including criminal history, not interacted peer measures for off-diagonal offenses, and socioeconomic variables. "Municip. charact." refers to a set of controls for the individual's municipality (at the time of incarceration) characteristics and municipality dummies. "Peer characteristics" refers to controls for share of inmates in particular demographic groups: under the age of 26, of non-Western origin, non-Danish residents, male, who have completed vocational education degree; and to controls for peer municipality characteristics such as average unemployment rate and average youth crime conviction rate. All specifications are simultaneously estimated as a SUR and include facility fixed effects. Robust standard errors clustered at the facility level are in parentheses. **: p<0.01, *: p<0.05.

9. Appendix

Table A 1: Variable definitions and primary data sources

Variable	Definition	Primary data source
Individual characteristics		
Recidivism rate overall	Dummy for having been convicted (i.e., found guilty) of any offense within one year after release	Central Police Register, Statistics Denmark (DST)
Recidivism rate; criminal offense of type j	Dummy for having been convicted (i.e., found guilty) of an offense of type j (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) within one year after release	Central Police Register, DST
Criminal history in crime category j prior to first incarceration	Dummy for having been convicted (i.e., found guilty) of at least one offense of type j (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) prior to the first incarceration	Central Police Register, DST
Male	Dummy for male	Population register, DST
Has a vocational degree	Dummy for having completed a vocational (professional) education degree at the time of incarceration	Educational Institution Register and Surveys, DST
Ethnic Dane	Dummy for being born in Denmark of Danish parents. The dummy equals 0 for first-generation and second-generation immigrants.	Population register, DST
Married	Dummy for being married at the time of incarceration	Population register, DST
Has at least one child under 6	Dummy for having at least one child under the age of six at the time of incarceration	Population register, DST
Age	Age at the time of incarceration	Population register, DST
Duration in days	Duration in days of the time spent during the first incarceration (in the longest spell in case the individual transfers across facilities)	Central Police Register, DST
Closed prison	Dummy for spending the longest spell in a closed prison	Central Police Register, DST
Of which Copenhagen prison	Dummy for spending the longest spell in one of the closed prisons in Copenhagen	Central Police Register, DST
Open prison	Dummy for spending the longest spell in an open prison	Central Police Register, DST
Local prison	Dummy for spending the longest spell in a local prison	Central Police Register, DST
Peer characteristics		
Share (in %) of peer under the age of 26 with a criminal history in crime category j	Weighted average of the share of other inmates under the age of 26 with at least one conviction of type j (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) at the individual's time of incarceration	Central Police Register, DST
Share (in %) of peer of the same ethnic origin with a criminal history in crime category j	Weighted average of the share of other inmates of the same ethnic origin (Western including Danish vs. non-Western) with at least one conviction of type j (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) at the individual's time of incarceration	Central Police Register, DST

Variable	Definition	Primary data source
Share (in %) of peer of the same ethnic origin and below age 26 with a criminal history in crime category *j*	Weighted average of the share of other inmates of the same ethnic origin (Western including Danish vs. non-Western) and below age 26 with at least one conviction of type *j* (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) at the individual's time of incarceration	Central Police Register, DST
Share (in %) of peer residing in the same county and below age 26 with a criminal history in crime category *j*	Weighted average of the share of other inmates residing in the same county and under the age of 26 at the individual's time of incarceration with at least one conviction of type *j* (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) at the individual's time of incarceration	Central Police Register, DST
Share (in %) of peer - general definition - with a criminal history in crime category *j*	Weighted average of the share of other inmates with at least one conviction of type *j* (j=misdemeanor assault, burglary, theft, stolen goods handling, drug-related offenses, other offenses) at the individual's time of incarceration	Central Police Register, DST
Share of inmates below the age of 26	Share of other inmates (foreigners excluded) below age 26 in the individual's year of incarceration	Central Police Register, Population Register, DST
Share of male inmates	Share of inmates (foreigners excluded) who are male	Central Police Register, Population Register, DST
Share of inmates of non-Western origin	Share of other inmates (foreigners excluded) who are immigrants (first or second generation) from a non-Western country	Central Police Register, Population Register, DST
Share of inmates non-Danish residents	Share of other inmates who are foreigners, i.e., do not have registered residence in Denmark, in the individual's year of incarceration	Central Police Register, DST
Share of inmates with a vocational education degree	Share of other inmates (foreigners excluded) who have completed a vocational (professional) education degree in the individual's year of incarceration	Central Police Register, Educational Institution Register and Surveys, DST
Unemployment rate in the peer's municipality of residence	Weighted average of the unemployment rate (in %) in the municipality of residence of peers in the year of incarceration of peers	Central Police Register, Population Register, DST
Overall crime rate in the peer's municipality of residence	Weighted average of the share (in %) of individuals aged 15 to 25 who have been convicted of an offense (except traffic offenses) committed in the municipality of residence of peers in the year of the incarceration of peers	"Statistiske Efterretninger om Social Sikring og Retsvæsen", DST (1986-1998)

Municipality Characteristics		
Real gross income in DKK	Average real gross income in DKK in the municipality in the individual's year of incarceration (in 2000-prices)	Authors' construction from time series IF221 and BEF1A in Statistikbanken, DST.
Unemployment rate	The unemployment rate (in %) in the municipality in the individual's year of incarceration	Authors' construction from time series AARD in Statistikbanken, DST.
Share of population of non-Western origin	Share of the municipal population of non-Western origin in the individual's year of incarceration	Authors calculations from population register, DST.
Gini coefficient	Gini coefficient of household incomes in the municipality in the individual's year of incarceration	Authors' calculations from tax register, DST.
Youth crime conviction rate	Share (in %) of individuals aged 15 to 25 living in the municipality who have been convicted of an offense (except traffic offenses) committed in the individual's year of incarceration	Central Police Register, DST

Variable	Definition	Primary data source
Crime detection rate	Annual number of charges divided by the annual number of reported crimes in the municipality (or police district) in the individual's year of incarceration	"Statistiske Efterretninger om Social Sikring og Retsvæsen", DST (1986-1998)
Reported crimes per capita	Number of reported crimes divided by the number of inhabitants in the municipality (or police district) in the year of the individual's incarceration	"Statistiske Efterretninger om Social Sikring og Retsvæsen", DST (1986-1998)
Reported violent crimes per 10,000 inhabitants	Number of reported violent crimes divided by the number of inhabitants in the municipality (or police district) and multiplied by 10,000 in the individual's year of the incarceration	"Statistiske Efterretninger om Social Sikring og Retsvæsen", DST (1986-1998)
Number of police agents per 1,000 inhabitants	Sum of number of detectives and uniformed police officers employed in the police district per 1,000 inhabitants.	Annual reports from the Police (1986-1999)
Labor market participation rate	Share of the population in the municipality who is active on the labor market in the year of the individual's incarceration	Authors' construction from time series RAS1 and BEF1A in Statistikbanken, DST.
Number of pupils per class	Average number of pupils per class (only normal classes) in the municipality in the individual's year of the incarceration	"Folkeskolen i de enkelte kommuner", Ministry of Education (1989-1993)

Table A 2: Crime-specific peer effects on recidivism (peers under the age of 26): All controls

Control variables	Dep. var.: Indicator for recidivism with					
	Misd. assault	**Burglary**	**Theft**	**Stolen goods**	**Vandalism**	**Drugs**
	(1)	(2)	(3)	(4)	(5)	(6)
OffenseXpeers_h (β_0)	0.001	0.006	-0.002	-0.021	-0.005	0.027**
	(0.003)	(0.006)	(0.006)	(0.015)	(0.004)	(0.010)
No_offenseXpeers_h (β_1)	-0.004*	-0.002	-0.003	-0.001	-0.003	-0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Share (in%) of peers under the age of 26 (weighted averages) with criminal history characteristics in						
Misdemeanor assault		-0.000	-0.001	-0.000	-0.000	0.000
		(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Burglary	-0.001		0.005*	0.003**	-0.001	0.003**
	(0.001)		(0.002)	(0.001)	(0.001)	(0.001)
Theft	-0.001	0.002		-0.001	0.001	-0.001
	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)
Stolen goods (handling)	-0.007**	0.009*	0.003		0.002	0.010**
	(0.003)	(0.004)	(0.004)		(0.002)	(0.004)
Vandalism	-0.004	0.006*	0.001	0.001		-0.002
	(0.003)	(0.003)	(0.003)	(0.001)		(0.003)
Drug-related offense	-0.003	0.001	-0.005	0.001	0.001	
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	
Criminal behavior before first incarceration (at least one conviction in offense h, ref. category: other types of offenses)						
Misdemeanor assault	-0.231	-0.221	-0.018	-0.060	0.017	-0.059
	(0.123)	(0.145)	(0.079)	(0.031)	(0.030)	(0.070)
Burglary	-0.067	-0.200	-0.014	-0.089	-0.041	0.345
	(0.118)	(0.186)	(0.110)	(0.062)	(0.056)	(0.256)
Theft	-0.065	0.099	0.047	0.013	-0.063	-0.111
	(0.072)	(0.107)	(0.125)	(0.031)	(0.045)	(0.102)
Stolen goods (handling)	-0.028	-0.119	-0.130	0.012	0.079	-0.312
	(0.075)	(0.147)	(0.127)	(0.071)	(0.082)	(0.200)
Vandalism	0.102	0.043	-0.047	0.051	-0.088	-0.122
	(0.067)	(0.072)	(0.085)	(0.037)	(0.056)	(0.111)
Drug-related offense	-0.167*	0.015	-0.007	-0.037	-0.023	-0.393
	(0.066)	(0.120)	(0.105)	(0.052)	(0.108)	(0.237)
Peer characteristics (Peer measure V: all other inmates) at the time of incarceration						
Share of male inmates	0.563	0.140	-0.487	0.139	-0.041	-0.286
	(0.310)	(0.359)	(0.408)	(0.188)	(0.185)	(0.317)
Share of inmates below the age of 26	-0.376**	-0.025	-0.176	-0.055	0.171*	0.022
	(0.114)	(0.136)	(0.137)	(0.069)	(0.067)	(0.127)
Share of inmates of non-Western origin	0.285	0.050	-0.370	0.004	-0.342*	0.383
	(0.210)	(0.288)	(0.270)	(0.130)	(0.160)	(0.228)
Share of inmates non-Danish residents	-0.293	0.212	0.295	-0.551**	-0.046	-0.420
	(0.287)	(0.406)	(0.411)	(0.166)	(0.220)	(0.323)
Share of inmates with a vocational education degree	0.159	0.084	-0.181	-0.020	-0.107	0.078
	(0.138)	(0.172)	(0.170)	(0.068)	(0.107)	(0.137)
Unemployment rate in the peer's municipality of residence	-0.011	0.010	-0.048*	0.006	0.003	-0.018
	(0.016)	(0.019)	(0.020)	(0.009)	(0.014)	(0.017)
Overall crime youth conviction rate in the	0.125	-0.038	0.124	0.018	-0.230**	0.078

peer's municipality of residence

	(0.088)	(0.095)	(0.106)	(0.051)	(0.059)	(0.083)

Socioeconomic individual characteristics in the year of incarceration

Male	0.043	0.069	-0.084	0.004	0.026	-0.004
	(0.022)	(0.037)	(0.049)	(0.021)	(0.014)	(0.045)
Has a vocational education degree	0.051	-0.011	0.014	-0.014	0.033	-0.002
	(0.062)	(0.038)	(0.078)	(0.023)	(0.058)	(0.034)
Ethnic Dane	0.020	-0.015	-0.017	0.000	-0.004	-0.039
	(0.020)	(0.023)	(0.026)	(0.010)	(0.014)	(0.021)
Married	0.055	0.008	-0.157	0.020	-0.010	-0.024
	(0.074)	(0.077)	(0.081)	(0.033)	(0.055)	(0.082)
Has at least one child under 6	0.030	-0.037	0.010	-0.031**	0.000	0.024
	(0.022)	(0.023)	(0.027)	(0.009)	(0.015)	(0.019)
Age	-0.006	-0.029**	-0.003	-0.006	-0.001	-0.001
	(0.007)	(0.008)	(0.009)	(0.004)	(0.006)	(0.007)

Individual characteristics of the municipality of residence in the year of incarceration (averages)

Log of real income in DKK	1.251	0.617	1.124	0.267	-1.324	0.035
	(0.971)	(1.115)	(1.164)	(0.576)	(0.753)	(1.024)
Unemployment rate	-0.008	0.003	0.025	-0.011	-0.002	-0.000
	(0.013)	(0.016)	(0.013)	(0.008)	(0.010)	(0.013)
Share of non-Western population	-0.002	0.022	0.021	-0.018	0.041*	-0.005
	(0.022)	(0.020)	(0.025)	(0.013)	(0.017)	(0.025)
Gini coefficient	-0.064	0.364	-1.014	-0.130	0.453	0.185
	(0.492)	(0.486)	(0.775)	(0.267)	(0.339)	(0.573)
Crime detection rate	-0.003	-0.001	0.004	-0.001	0.004	0.003
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Youth crime conviction rate	-0.024	-0.015	0.003	-0.029	0.003	0.047
	(0.030)	(0.030)	(0.034)	(0.015)	(0.016)	(0.027)
Reported crimes per capita	-0.014	-0.013	0.012	-0.011	0.004	-0.005
	(0.012)	(0.012)	(0.014)	(0.007)	(0.009)	(0.011)
Reported violent crimes per 10,000 inhabitants	-0.141	-0.206	0.192	-0.146	-0.022	0.151
	(0.121)	(0.123)	(0.153)	(0.086)	(0.116)	(0.124)
Number of pupils per class	-0.007	0.005	-0.012	-0.005	0.007	-0.027**
	(0.008)	(0.010)	(0.011)	(0.006)	(0.004)	(0.009)
Number of police officers per 1,000 inhab.	0.034	-0.164	-0.284	0.094	0.064	0.108
	(0.134)	(0.157)	(0.156)	(0.078)	(0.100)	(0.137)
Labor market participation rate	-0.018	-0.013	-0.006	-0.002	0.021	-0.008
	(0.018)	(0.019)	(0.018)	(0.012)	(0.011)	(0.016)
Time fixed effects			YES			
Facility-by-prior-offense fixed effects			YES			
R-squared	0.319	0.386	0.410	0.345	0.363	0.353
Observations			1,928			

Notes: Each column represents a different specification. For instance, offense *h* in the two peer measures for column (1) is misd. assault. In this table, peers are defined as other inmates below the age of 26. All specifications are simultaneously estimated as a SUR and include facility fixed effects. Robust standard errors clustered at the facility level are in parentheses. **: $p < 0.01$, *: $p < 0.05$.

Table A 3: Predicted recidivism on the relevant peer measure (peers from the same ethnic group)

	Dependent variable: Indicator for predicted recidivism with											
	Panel A						Panel B					
	Misd. Assault	**Burglary**	**Theft**	**Stolen goods**	**Vandalism**	**Drugs**	**Misd. Assault**	**Burglary**	**Theft**	**Stolen goods**	**Vandalism**	**Drugs**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OffenseXpeers_h	0.005**	0.015**	0.011**	0.002*	0.005**	0.017**	0.001	-0.004	0.002	-0.004	0.001	0.001
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
No_offenseXpeers_h	-0.002	0.003	0.003	-0.001	-0.001	0.002	0.000	0.003	0.003	-0.001	-0.001	0.002
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Facility-by-prior-offense fixed effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
R-squared	0.081	0.201	0.104	0.005	0.014	0.136	0.321	0.500	0.426	0.301	0.289	0.370
Observations	1,928						1,928					

Notes: The dependent variable is recidivism (in h offense) predicted using individual and municipality characteristics, including municipality dummies, in the year of incarceration and facility fixed effects. We exclude municipality characteristics that present high multicollinearity from the set of regressors. Predicted recidivism is then regressed only on the interacted peer measures relevant for each offense (in the head of each column) and facility-by-prior-offense fixed effects in columns (7) to (12). Each column represents a different specification. For instance, offense h in the two peer measures in columns (1) and (7) is misdemeanor assault. Specifications (1) to (12) are simultaneously estimated as a SUR. Robust standard errors clustered at the facility level are in parentheses. **: p<0.01, *: p<0.05.

Table A 4: Predicted recidivism on the relevant peer measure (peers from the same ethnic group below the age of 26)

	Dependent variable: Indicator for predicted recidivism with											
	Panel A						Panel B					
	Misd. assault	Burglary	Theft	Stolen goods	Vandalism	Drugs	Misd. Assault	Burglary	Theft	Stolen goods	Vandalism	Drugs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OffenseXpeers_h	0.002**	0.010**	0.006**	0.003**	0.003**	0.013**	-0.000	-0.002	0.000	0.002	0.000	-0.004*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
No_offenseXpeers_h	-0.001*	0.000	-0.001	-0.000	-0.000	-0.001	0.000	0.001	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Facility-by-prior-offense fixed effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
R-squared	0.055	0.169	0.081	0.002	0.011	0.102	0.321	0.492	0.424	0.304	0.285	0.368
Observations	1,928						1,928					

Notes: The dependent variable is recidivism (in h offense) predicted using individual and municipality characteristics, including municipality dummies, in the year of incarceration and facility fixed effects. We exclude municipality characteristics that present high multicollinearity from the set of regressors. Predicted recidivism is then regressed only on the interacted peer measures relevant for each offense (in the head of each column) and facility-by-prior-offense fixed effects in columns (7) to (12). Each column represents a different specification. For instance, offense h in the two peer measures in columns (1) and (7) is misdemeanor assault. Specifications (1) to (12) are simultaneously estimated as a SUR. Robust standard errors clustered at the facility level are in parentheses. **: p<0.01, *: p<0.05.

Table A 5: Predicted recidivism on the relevant peer measure (all peers)

	Dependent variable: Indicator for predicted recidivism with											
	Panel A						Panel B					
	Misd. assault	Burglary	Theft	Stolen goods	Vandalism	Drugs	Misd. Assault	Burglary	Theft	Stolen goods	Vandalism	Drugs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OffenseXpeers_h	0.006**	0.018**	0.016**	0.002	0.005*	0.019**	0.001	0.003	0.001	-0.005	0.001	-0.003
	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.004)	(0.002)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)
No_offenseXpeers_h	-0.003*	0.005	0.007	-0.002	-0.001	0.002	0.001	0.007**	0.005	-0.002	-0.001	0.004
	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)
Facility-by-prior-offense fixed effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
R-squared	0.081	0.201	0.104	0.005	0.014	0.136	0.321	0.500	0.426	0.301	0.289	0.370
Observations	1,928						1,928					

Notes: The dependent variable is recidivism (in h offense) predicted using individual and municipality characteristics, including municipality dummies, in the year of incarceration and facility fixed effects. We exclude municipality characteristics that present high multicollinearity from the set of regressors. Predicted recidivism is then regressed only on the interacted peer measures relevant for each offense (in the head of each column) and facility-by-prior-offense fixed effects in columns (7) to (12). Each column represents a different specification. For instance, offense h in the two peer measures in columns (1) and (7) is misdemeanor assault. Specifications (1) to (12) are simultaneously estimated as a SUR. Robust standard errors clustered at the facility level are in parentheses. **: p<0.01, *: p<0.05.

Table A 6: Predicted recidivism on the relevant peer measure (peers from the same county below the age of 26)

	Dependent variable: Indicator for predicted recidivism with											
	Panel A						Panel B					
	Misd. assault	Burglary	Theft	Stolen goods	Vandalism	Drugs	Misd. Assault	Burglary	Theft	Stolen goods	Vandalism	Drugs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OffenseXpeers_h	0.001**	0.006**	0.006**	0.001	0.002**	0.011**	-0.001**	0.001*	0.001	-0.000	-0.000	-0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
No_offenseXpeers_h	-0.001**	0.000	-0.001	-0.001*	-0.000	-0.001	-0.000	0.001**	-0.000	-0.001*	-0.000	-0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Facility-by-prior-offense fixed effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
R-squared	0.034	0.114	0.075	0.003	0.006	0.071	0.324	0.495	0.424	0.301	0.285	0.367
Observations	1,928						1,928					

Notes: The dependent variable is recidivism (in h offense) predicted using individual and municipality characteristics, including municipality dummies, in the year of incarceration and facility fixed effects. We exclude municipality characteristics that present high multicollinearity from the set of regressors. Predicted recidivism is then regressed only on the interacted peer measures relevant for each offense (in the head of each column) and facility-by-prior-offense fixed effects in columns (7) to (12). Each column represents a different specification. For instance, offense h in the two peer measures in columns (1) and (7) is misdemeanor assault. Specifications (1) to (12) are simultaneously estimated as a SUR. Robust standard errors clustered at the facility level are in parentheses. **: $p<0.01$, *: $p<0.05$.

Table A 7: Crime-specific peer effects on recidivism (peers under the age of 26): All controls; 10 offense categories and no facility-by-prior-offense fixed effects

Control variables	Dep. var.: Indicator for recidivism with									
	Misd. assault	**Agg. assault**	**Burglary**	**Theft**	**Fraud**	**Stolen goods**	**Robbery**	**Vandalism**	**Drugs**	**Weapons**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
OffenseXpeers_h (β_0)	-0.004	0.007	0.005	0.007	0.004	-0.010	0.003	-0.001	0.020*	0.002
	(0.002)	(0.007)	(0.005)	(0.006)	(0.002)	(0.006)	(0.003)	(0.003)	(0.009)	(0.003)
No_offenseXpeers_h (β_1)	-0.002	0.000	-0.003	0.002	-0.001	0.000	-0.001	-0.003*	-0.002	-0.002
	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)

Share (in%) of peers under the age of 26 (weighted averages) with criminal history characteristics in

Misdemeanor assault		-0.000	-0.000	0.002	-0.001	-0.000	0.000	-0.001	-0.000	-0.001
		(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Aggravated assault	-0.000		-0.002	0.001	-0.000	-0.001	0.001	-0.001	-0.001	0.001
	(0.002)		(0.002)	(0.002)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Burglary	-0.002	0.000		0.004	0.000	0.002	0.000	-0.001	0.002	0.001
	(0.001)	(0.001)		(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Theft	-0.001	-0.003**	0.000		0.000	-0.001	0.001	-0.003*	-0.002	0.003*
	(0.002)	(0.001)	(0.002)		(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Fraud	-0.006*	-0.003	0.010*	-0.006		0.002	0.005**	-0.006*	-0.004	-0.001
	(0.003)	(0.002)	(0.005)	(0.004)		(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
Stolen goods (handling)	-0.004	-0.001	0.008*	0.004	-0.002		-0.001	0.001	0.008*	-0.001
	(0.002)	(0.001)	(0.004)	(0.005)	(0.001)		(0.002)	(0.002)	(0.004)	(0.001)
Robbery	0.000	-0.002	-0.002	0.003	0.000	0.000		-0.001	0.000	0.002
	(0.002)	(0.001)	(0.004)	(0.002)	(0.001)	(0.001)		(0.002)	(0.002)	(0.001)
Vandalism	-0.004	-0.001	0.004	0.004	0.001	-0.001	-0.001		-0.001	-0.001
	(0.002)	(0.001)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)		(0.002)	(0.001)
Drug-related offense	-0.003	-0.002*	-0.000	-0.001	0.000	0.000	0.003**	-0.001		0.001
	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)		(0.001)
Offenses against the weapons act	0.001	-0.001	0.004	0.000	0.004*	-0.001	0.002	-0.001	0.005	
	(0.003)	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	

Criminal behavior before first incarceration (at least one conviction in offense h, ref. category: other types of offenses)

Misdemeanor assault	0.079*	0.002	-0.071**	-0.054**	-0.018**	-0.004	0.000	-0.006	-0.026*	-0.005
	(0.037)	(0.006)	(0.010)	(0.014)	(0.005)	(0.007)	(0.006)	(0.007)	(0.012)	(0.005)
Aggravated assault	0.007	0.005	-0.111**	-0.069*	-0.002	-0.005	-0.003	0.009	0.001	-0.013
	(0.024)	(0.027)	(0.029)	(0.032)	(0.018)	(0.014)	(0.009)	(0.011)	(0.027)	(0.009)
Burglary	-0.017	0.010	0.024	-0.039*	-0.006	0.025**	0.010	-0.012	0.010	0.011
	(0.010)	(0.010)	(0.063)	(0.019)	(0.008)	(0.009)	(0.013)	(0.007)	(0.019)	(0.011)
Theft	0.046**	-0.014**	0.021	0.018	0.010	0.005	-0.002	0.019	0.027	-0.002
	(0.010)	(0.005)	(0.015)	(0.056)	(0.006)	(0.006)	(0.007)	(0.012)	(0.014)	(0.010)
Fraud	0.009	-0.019*	-0.001	-0.002	-0.030*	0.033	0.010	-0.004	0.024	-0.019
	(0.025)	(0.009)	(0.033)	(0.030)	(0.014)	(0.029)	(0.018)	(0.014)	(0.029)	(0.020)
Stolen goods (handling)	-0.021	0.008	-0.030	0.047	0.003	0.052	-0.010	0.008	0.009	-0.001
	(0.025)	(0.015)	(0.024)	(0.036)	(0.015)	(0.029)	(0.014)	(0.021)	(0.029)	(0.020)
Robbery	0.038	0.006	-0.059*	-0.102**	-0.033**	0.005	-0.011	-0.018*	0.019	-0.007
	(0.021)	(0.010)	(0.024)	(0.024)	(0.009)	(0.014)	(0.019)	(0.007)	(0.022)	(0.013)

Control variables	Dep. var.: Indicator for recidivism with									
	Misd. assault	**Agg. assault**	**Burglary**	**Theft**	**Fraud**	**Stolen goods**	**Robbery**	**Vandalism**	**Drugs**	**Weapons**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Vandalism	0.019	-0.003	0.027	-0.024	-0.021**	0.012	-0.001	0.018	0.011	-0.009
	(0.018)	(0.007)	(0.021)	(0.020)	(0.006)	(0.013)	(0.007)	(0.023)	(0.017)	(0.009)
Drug-related offense	-0.007	-0.007	0.039	0.082**	0.002	0.025*	0.011	0.023	-0.023	0.018
	(0.013)	(0.009)	(0.026)	(0.031)	(0.012)	(0.013)	(0.012)	(0.016)	(0.059)	(0.015)
Offenses against the weapons act	0.025	0.002	0.024	-0.009	-0.001	-0.005	-0.001	-0.007	0.012	-0.038*
	(0.015)	(0.012)	(0.025)	(0.027)	(0.010)	(0.011)	(0.012)	(0.012)	(0.019)	(0.020)

Peer characteristics (general definition) at the time of incarceration

Control variables										
Share of male inmates	0.518*	-0.027	-0.021	-0.381	0.116	0.116	-0.195	0.109	-0.067	0.047
	(0.238)	(0.136)	(0.312)	(0.407)	(0.108)	(0.155)	(0.190)	(0.200)	(0.259)	(0.165)
Share of inmates below the age of 26	-0.270**	-0.019	0.061	-0.066	-0.008	-0.041	-0.004	0.117	-0.000	-0.022
	(0.084)	(0.066)	(0.141)	(0.148)	(0.035)	(0.066)	(0.068)	(0.080)	(0.125)	(0.068)
Share of inmates of non-Western origin	0.144	-0.026	0.152	-0.483*	-0.111	-0.047	-0.083	-0.211*	0.317	-0.043
	(0.185)	(0.103)	(0.221)	(0.229)	(0.067)	(0.141)	(0.153)	(0.100)	(0.252)	(0.141)
Share of inmates non-Danish residents	-0.164	0.138	0.502	-0.028	0.081	-0.268*	-0.126	0.109	-0.351*	-0.013
	(0.260)	(0.214)	(0.344)	(0.431)	(0.120)	(0.136)	(0.158)	(0.162)	(0.169)	(0.130)
Share of inmates with a vocational education degree	0.161	0.027	0.195	-0.019	0.024	-0.036	0.012	-0.130	-0.053	0.016
	(0.150)	(0.080)	(0.186)	(0.211)	(0.062)	(0.055)	(0.078)	(0.132)	(0.093)	(0.084)
Unemployment rate in the peer's municipality of residence	-0.009	0.014*	-0.005	-0.022	0.004	0.005	0.008	0.009	-0.018	-0.013
	(0.014)	(0.006)	(0.017)	(0.024)	(0.008)	(0.010)	(0.010)	(0.011)	(0.015)	(0.009)
Overall youth crime conviction rate in the peer's municipality of residence	0.110	-0.051	-0.059	0.098	0.002	0.004	-0.023	-0.219**	-0.019	0.162**
	(0.064)	(0.038)	(0.080)	(0.090)	(0.041)	(0.047)	(0.046)	(0.041)	(0.083)	(0.053)

Socioeconomic individual characteristics in the year of incarceration

Control variables										
Male	0.070**	0.002	0.103**	-0.079	-0.018	0.009	0.037	0.026*	-0.021	0.058**
	(0.025)	(0.022)	(0.025)	(0.041)	(0.026)	(0.014)	(0.022)	(0.012)	(0.031)	(0.018)
Has a vocational education degree	0.052	0.003	-0.024	0.096	0.041	-0.010	-0.007	0.074	-0.016	0.068
	(0.071)	(0.009)	(0.035)	(0.114)	(0.051)	(0.014)	(0.011)	(0.082)	(0.026)	(0.076)
Ethnic Dane	0.023	-0.003	-0.007	-0.013	-0.010	-0.000	-0.016	-0.003	-0.021	-0.013
	(0.021)	(0.009)	(0.017)	(0.027)	(0.018)	(0.011)	(0.013)	(0.010)	(0.026)	(0.017)
Married	0.055	-0.039	-0.001	0.141	-0.044	0.352	-0.018	0.003	0.154	-0.002
	(0.045)	(0.038)	(0.109)	(0.206)	(0.046)	(0.272)	(0.034)	(0.033)	(0.292)	(0.021)
Has at least one child under 6	0.034	-0.004	-0.030*	0.027	-0.002	-0.022**	-0.003	0.006	0.024	-0.003
	(0.023)	(0.010)	(0.015)	(0.025)	(0.009)	(0.008)	(0.012)	(0.012)	(0.023)	(0.012)
Age	-0.006	-0.003	-0.032**	-0.024**	-0.004	-0.005	-0.006	-0.002	-0.008	-0.005
	(0.005)	(0.003)	(0.007)	(0.009)	(0.004)	(0.005)	(0.003)	(0.004)	(0.011)	(0.003)

Control variables	Dep. var.: Indicator for recidivism with									
	Misd. assault	**Agg. assault**	**Burglary**	**Theft**	**Fraud**	**Stolen goods**	**Robbery**	**Vandalism**	**Drugs**	**Weapons**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Individual characteristics of the municipality of residence in the year of incarceration (averages)

Control variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of real income in DKK	1.049	0.377	1.051	0.687	-0.090	0.095	0.405	-1.084*	-0.137	-0.667
	(0.731)	(0.335)	(1.047)	(1.139)	(0.386)	(0.709)	(0.444)	(0.508)	(0.805)	(0.617)
Unemployment rate	-0.005	0.002	0.015	0.011	-0.002	-0.008	-0.006	0.007	-0.001	-0.013*
	(0.012)	(0.004)	(0.013)	(0.015)	(0.005)	(0.009)	(0.008)	(0.008)	(0.013)	(0.006)
Share of non-Western population	-0.005	0.006	0.009	0.025	-0.020*	-0.019	0.001	0.046**	-0.007	0.007
	(0.016)	(0.012)	(0.018)	(0.029)	(0.009)	(0.011)	(0.009)	(0.014)	(0.019)	(0.009)
Gini coefficient	-0.331	-0.030	-0.134	-0.829	0.003	-0.233	-0.291	0.366	0.371	0.125
	(0.531)	(0.226)	(0.474)	(0.642)	(0.173)	(0.295)	(0.260)	(0.306)	(0.544)	(0.187)
Crime detection rate	-0.002	-0.001	-0.000	0.003	0.002	-0.001	0.001	0.004*	0.002	0.001
	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Youth crime conviction rate	-0.023	0.018	0.000	0.007	-0.003	-0.006	0.023*	0.003	0.044*	-0.017
	(0.026)	(0.016)	(0.027)	(0.026)	(0.010)	(0.014)	(0.011)	(0.012)	(0.021)	(0.014)
Reported crimes per capita	-0.008	-0.012*	-0.014	0.002	-0.005	-0.007	0.001	0.000	0.001	-0.004
	(0.008)	(0.006)	(0.013)	(0.015)	(0.005)	(0.007)	(0.007)	(0.006)	(0.010)	(0.007)
Reported violent crimes per 10,000 inhabitants	-0.168*	-0.015	-0.112	0.279	-0.026	-0.108	-0.057	-0.084	0.088	0.033
	(0.072)	(0.064)	(0.115)	(0.159)	(0.063)	(0.071)	(0.058)	(0.121)	(0.104)	(0.054)
Number of pupils per class	-0.003	0.003	0.008	-0.007	-0.006	-0.002	-0.007	0.002	-0.022**	0.011
	(0.007)	(0.002)	(0.008)	(0.012)	(0.005)	(0.006)	(0.005)	(0.003)	(0.006)	(0.007)
Number of police officers per 1,000 inhab.	0.037	0.056	-0.176	-0.137	-0.017	0.026	-0.033	0.130	0.133	0.034
	(0.132)	(0.041)	(0.154)	(0.178)	(0.039)	(0.084)	(0.104)	(0.080)	(0.155)	(0.054)
Labor market participation rate	-0.016	-0.007	-0.027	-0.009	-0.008	-0.008	0.003	0.013	-0.014	0.030**
	(0.014)	(0.009)	(0.017)	(0.019)	(0.007)	(0.010)	(0.012)	(0.007)	(0.011)	(0.011)
Time fixed effects						YES				
Facility-by-prior-offense fixed effects						NO				
R-squared	0.205	0.187	0.230	0.243	0.188	0.176	0.169	0.241	0.211	0.201
Observations						1,928				

Notes: Each column represents a different specification. For instance, offense *h* in the two peer measures for column (1) is misd. assault. In this table, peers are defined as other inmates below the age of 26. All specifications are simultaneously estimated as a SUR, include facility fixed effects but no facility-by-prior-offense fixed effects. The ten chosen offense categories represent offenses that are the most committed within one year upon first release and are easy to interpret for policy purposes. Robust standard errors clustered at the facility level are in parentheses. **: $p<0.01$, *: $p<0.05$.