

# Encouraging desistance from crime\*

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Half of individuals released from prison in the United States will be re-incarcerated within three years, creating an incarceration cycle that is detrimental to individuals, families, and communities. There is tremendous public interest in ending this cycle, and public policies can help or hinder the reintegration of those released from jail and prison. This review summarizes the existing empirical evidence on how to intervene with existing offenders to reduce criminal behavior and improve social welfare.

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# 1 Introduction

High recidivism rates are a policy concern in many countries (Yukhnenko, Sridhar and Fazel, 2019). The best data available from the United States suggest that two-thirds of those released from prison will be arrested again within three years, and half will be re-incarcerated (DuRose, Cooper and Snyder, 2014). This appears to be driven by a subset of individuals who repeatedly cycle through the system (Rhodes et al., 2016), and most felony defendants have a prior arrest or conviction.<sup>1</sup> Encouraging desistance from crime will be necessary to achieve a meaningful reduction in both crime rates and incarceration rates in the United States.<sup>2</sup> Others have written about how to deter crime in the general population, including among those who have not yet offended.<sup>3</sup> But what is the best way to handle those who have already committed one or more crimes? What interventions should be imposed on offenders to reduce their rate of reoffending, and increase social welfare going forward?

There is a tremendous amount written on desistance elsewhere, particularly in criminology.<sup>4</sup> I do not seek to recreate what others have done. Instead, I aim to make two contributions: (1) summarize existing empirical evidence on interventions related to desistance, through the lens of economic theory; and (2) focus on well-identified empirical studies that (based on assumptions that are plausible, in my judgment) measure the causal effects of relevant policies and programs. In recent years, there has been a wave of new, high-quality work on this topic, across several academic disciplines, so this is a useful time to take stock of

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<sup>1</sup>Based on State Court Processing Statistics data from 2009 (the most recent year available), 74% of all felony defendants in urban areas had at least one prior arrest and 58% had at least one prior conviction. Many reported crimes don't result in an arrest or conviction, but these data suggest that a large share of crimes are committed by people who have offended in the past.

<sup>2</sup>There are several definitions of desistance in the literature. In this review I define desistance as reducing the likelihood of reoffending and/or the number/severity of crimes committed in the future. I will use the phrase "encourage desistance" interchangeably with "reduce recidivism." Note that many criminologists see a meaningful distinction between these terms. In particular, they typically use the term 'recidivism' to refer to any reoffending (a binary outcome), while 'desistance' refers to a reduction in the frequency or severity of reoffending as someone becomes more law-abiding over time. See the following for deeper discussions of this issue: National Research Council (2008); Nakamura and Bucklen (2014); Butts and Schiraldi (2018); Klingele (2019).

<sup>3</sup>Chalfin and McCrary (2017) and Nagin (2013) review the theory and evidence on deterrence for the general population.

<sup>4</sup>For reviews see: Laub and Sampson (2001); Bersani and Doherty (2018); Weaver (2019).

the current state of this diverse, multi-disciplinary literature, to inform research and policy going forward. Identifying those studies that quantify causal effects, from the much larger pool of empirical evidence that is more descriptive, is a primary contribution of this review. I draw on studies from a variety of disciplines (including economics, criminology, sociology, political science, and public health) that provide compelling tests of hypotheses about how interventions affect desistance, and synthesize their findings.

To do this, I generated a list of studies focused on people who have at least some prior criminal justice involvement.<sup>5</sup> In practice, this means at least one arrest, conviction, or incarceration spell. To identify empirical studies relevant to this review, I began with a list of known papers on recidivism, and created a snowball sample of other studies that (i) those papers cited or (ii) cited those papers. This list included all papers listed in the CrimeSolutions research clearinghouse maintained by the National Institute of Justice, and the Washington State Institute for Public Policy's Benefit-Cost clearinghouse on criminal justice research. I screened the resulting list for studies that consider the causal effects of interventions related to desistance, then iterated on this process until I stopped finding new papers. I then read all of the papers that (based on their abstracts) appeared to measure causal effects, keeping only those where the underlying analyses provided compelling causal estimates. The remaining set of papers are those that are reviewed below. Tables 1 - 5 list the relevant studies by topic.

Any given study typically includes a variety of empirical estimates and robustness checks. Throughout this review, I highlight the estimates I view as most relevant to the question at hand; this sometimes differs from the estimates highlighted by the authors of the original study. Sometimes my interpretation of a study's findings differs substantially from the authors' interpretation.

Drawing causal inferences from a particular set of empirical estimates always requires some assumptions. Determining whether those assumptions are reasonable relies in large

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<sup>5</sup>This list was generated in 2018 and early 2019. I excluded studies focused on special populations such as sex offenders or domestic abusers.

part on my professional judgment; there is no one-size-fits-all definition based on empirical strategy. In practice, well-identified studies tend to use randomized controlled trials or natural experiments that plausibly sort individuals into otherwise-similar treatment and comparison groups.<sup>6</sup> I did not constrain the journals from which such studies could be drawn, and included high-quality working papers that weren't yet published in peer-reviewed journals.

## 2 Background and theoretical framework

### 2.1 Descriptive statistics on individuals with criminal records

Understanding the characteristics of those who have committed crime in the past helps us generate hypotheses about which types of interventions may encourage desistance. In general, we know relatively little about this population. This is in part because large survey datasets such as the American Community Survey and Current Population Survey do not ask about criminal history.<sup>7</sup> Based on what information we do have, we know that this group is disproportionately male, and disproportionately Black and Hispanic. In 2019, 93% of sentenced inmates were male, 32.8% were Black, and 23.2% were Hispanic (Carson, 2020).<sup>8</sup> Reducing the rate at which people cycle back through the criminal justice system will thus disproportionately benefit people from these groups.<sup>9</sup>

We also know that people with criminal records face a variety of disadvantages. On average, they have less education, and limited and interrupted work histories (Raphael, 2011; Doleac, 2016; Yang, 2017b; Looney and Turner, 2018). They also have problems correlated with poverty – for instance, they may not have reliable transportation, stable

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<sup>6</sup>A large number of studies in this space make causal claims based on analyses using matched comparison groups. Most of these studies are not included in this review because I do not view the underlying assumption – that treatment assignment is as-good-as-random after controlling for observable characteristics – as plausible in the relevant context. In most cases, it seems likely that the treatment and comparison groups differ substantially on important unobservable characteristics such as motivation.

<sup>7</sup>The Criminal Justice Administrative Records System (CJARS) is poised to change this. It harmonizes and links individual-level administrative criminal justice records with data maintained by the U.S. Census Bureau.

<sup>8</sup>In 2019, only 13.4% of U.S. residents were Black and 18.5% were Hispanic (U.S. Census Bureau, 2019).

<sup>9</sup>See Doleac (forthcoming) for a review of the evidence on racial bias in the criminal justice system, and what we know about how to reduce racial disparities in criminal justice outcomes.

housing, or a government ID. Criminal justice involvement may also mean they owe court debt and child support arrears. Their driver's licenses may be suspended due to the court debt they owe (Holzer, Raphael and Stoll, 2003; Ciolfi, Levy-Lavelle and Salas, 2016). Aside from the direct impacts of criminal justice involvement on fees, fines, and other debts, the direction of causality between these disadvantages and criminal behavior is unclear: these problems may be part of the reason that people commit crime, or they may be the result of past criminal behavior. Alternatively, both poverty/unemployment and criminal behavior could be the result of some other factor such as mental illness or substance use.

A large share of people incarcerated in jail or prison have a history of mental illness. Data from the 2011-12 National Inmate Survey indicate that 26% of jail inmates and 14% of prison inmates exhibit signs of serious psychological distress (Bronson and Berzofsky, 2017). A full 44% of jail inmates and 37% of prison inmates have a history of mental health problems. For context, the rate of serious psychological distress among those with no criminal justice involvement is 4% – though the general population is not typically screened for mental illness, so this is likely an underestimate (Bronson and Berzofsky, 2017).

The incarcerated also have high rates of substance use disorders. National Inmate Surveys in 2007 and 2008-09 found that 42% of state prisoners and 47% of sentenced jail inmates met the criteria for drug dependence; 58% of state prisoners and 63% of jail inmates met the criteria for drug abuse (Bronson, Stroop, Zimmer and Berzofsky, 2017). For comparison, rates of drug dependence and abuse in the adult general population are 3% and 5%, respectively (Bronson, Stroop, Zimmer and Berzofsky, 2017). Substance use could increase criminal behavior through a direct physiological effect (e.g., a drug that makes someone more aggressive) and/or because funding an addiction could increase financial pressure to commit property crime – particularly if drug use makes it difficult to maintain stable employment.

A lengthy criminology literature considers the relationship between age and criminal offending over the life course (the 'age-crime profile'). The broad consensus in that literature is that age is the single best predictor of desistance (see for example, Hirschi and Gottfredson,

1983). This literature has observed that crime rates increase continuously until about age 18-20, then decrease (see for example Landersø, Nielsen and Simonsen, 2017). A small subset of offenders continue to commit crime for much longer. For most offenders, then, we might be able to simply wait for them to mature and ‘grow out of’ criminal behavior.

An extensive criminology literature also considers whether various life events serve as ‘turning points’ that reduce criminal behavior (see for example, Sampson and Laub, 1993). Getting married, having a child, and beginning a new job are all examples of such turning points. Of course, the timing of life events may be a function of other factors that simultaneously affect criminal behavior; it is therefore difficult to tell if such events *caused* a subsequent reduction in crime (Nguyen and Loughran, 2018). However, researchers have established an association between the timing of these life events and desistance from crime.

These relationships – between age and crime, and between life events and crime – raise the policy-relevant question of whether interventions imposed on criminal offenders can affect someone’s ‘natural’ desistance process, for better or worse. That is the focus of this review.

### 2.1.1 Discount rates

The rate at which existing offenders discount the future is a personal characteristic with important policy implications, as it helps determine which interventions affect behavior. The importance of discount rates in this context has been discussed in the literature for decades.<sup>10</sup> A small handful of studies estimate discount rates for the population of criminal offenders. Because this characteristic is not easily observed, I will briefly review the literature that aims to measure it.

There are several channels through which time preferences could affect criminal behavior over the life course, including responses to potential criminal penalties as well as investment in education aimed at increasing human capital. Several studies use surveys and lab experiments to elicit time preferences (e.g., Nagin and Pogarsky, 2004; Jolliffe and Farring-

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<sup>10</sup>See for example, Ehrlich, 1973; Cook, 1980; Wilson and Hernstein, 1985; Davis, 1988; Polinsky and Shavell, 1999; Katz, Levitt and Shustorovich, 2003; McCrary, 2010; and Polinsky and Riskind, 2018.

ton, 2009; Mancino, Navarro and Rivers, 2015; Åkerlund, Golsteyn, Grönqvist and Lindahl, 2016). They typically find that subjects with higher discount rates as children are more likely to engage in delinquent or criminal behavior in the future. An advantage of focusing on survey questions or lab experiments is being able to isolate the effect of time preferences from, for instance, self control. A drawback of this approach is that it is difficult to translate the estimated magnitudes (instead of simply the sign) into the specific discount factors necessary for optimal policy-making.

Lee and McCrary (2017) focus on the response to a change in punishment severity, for a population that has been arrested for a serious felony offense at least once by age 17. This group is directly relevant to the population of interest in this review, since they have personal experience with the criminal justice process and potential penalties.<sup>11</sup> The authors use the change in expected sentence length at age 18 (when defendants become more likely to be tried as adults) as a natural experiment to estimate the discount rates of individuals around this age threshold. Using arrest data from Florida from 1995 to 2002, they find a small decrease (1.8%) in the log-odds of being arrested after age 18, due to the large increase in expected punishment at this age threshold. This is consistent with myopic behavior. In contrast with a standard ‘patient’ discount factor of 0.95, this analysis rules out discount factors larger than 0.022 for this population.<sup>12</sup>

Mastrobuoni and Rivers (2017) focus on another relevant population: individuals with at least one prior incarceration spell in Italy. Using quasi-experimental variation in sentence length from a large collective pardon that occurred in Italy in 2006, along with information on recidivism, they estimate an average annual discount factor of 0.74 among this population. This average masks substantial heterogeneity: estimated discount factors are much higher

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<sup>11</sup>Hjalmarsson (2009a) tests whether NLSY respondents know of the increased penalties at the age of majority; she finds that they do, but that their estimates of the increase in the penalty are smaller than the true increase. In general it would be difficult to distinguish high discount rates from lack of knowledge about potential penalties. Focusing on a population that has experienced relevant penalties in the past reduces this concern.

<sup>12</sup>Using the same approach, Guarín, Medina and Tamayo (2013) estimate similar effects using data from Medellín, Colombia.

for some groups (e.g., 0.99 for those with high education, and 0.95 for those convicted of crimes related to organized prostitution), and lower for others (e.g., 0.66 for immigrants, and 0.70 for drug offenders). Even the lowest of these estimates is much higher than the 0.022 estimate from Lee and McCrary (2017). An important difference between these study populations is age: the sample in Lee and McCrary (2017) was age 17 to 19, while the ages of the Italian offenders in Mastrobuoni and Rivers (2017) range from 19 to 70, with a mean of 38. It is possible that discount factors increase with age, which may help explain the age-crime profile.

These low discount factors have important policy implications: changing payoffs that are only realized in the distant future are unlikely to change decisions about whether to engage in crime in the present. This includes penalties such as sentence enhancements, or interventions that may increase legal income after several years of investment (e.g. education or job training programs).

## 2.2 Theoretical framework

For those concerned about recidivism, the policy goal is to find interventions that have beneficial effects on an individual's future decisions. To fix ideas, consider an individual deciding whether to commit a crime. In the spirit of the model first proposed by Becker (1968), they face the following set of potential payoffs:

$$U^* = \begin{cases} U_{nc}(\tilde{Y}(H, \gamma), \lambda) & \text{if an individual does not commit a crime} \\ E(U_c) & \text{if an individual does commit a crime,} \end{cases}$$

where  $E(U_c) = pU_c(Y(C, \gamma) - s, \lambda) + (1 - p)(U_c(Y(C, \gamma), \lambda)),$

and where

Y is the perceived payoff (monetary or psychic) from committing a crime,

$\tilde{Y}$  is the perceived payoff (monetary or psychic) from a non-criminal outside option,

H is non-criminal capital,

C is criminal capital,

$\gamma$  measures attitudes and preferences over legal and illegal behavior,  
 $\lambda$  measures risk preferences and/or discounting,  
 $s$  is the perceived cost of punishment (monetary plus psychic),  
 $p$  is the perceived probability of punishment.

The threat of a punishment such as a prison sentence could deter crime among the general population. For a given offender who has committed a crime and is now facing this punishment, though, the consequences are less clear. Imposing a prison sentence could prevent reoffending through an incapacitation effect – it will be difficult to commit more crime while in prison. But that prison sentence could simultaneously affect several of the parameters above. The experience of incarceration could change an offender’s perception of  $s$ , the cost of punishment. Incarceration could also affect  $H$ , if it interrupts education or if job skills atrophy while they are in prison;  $C$ , if incarceration builds their criminal network and crime-specific skills;  $p$ , if fellow inmates teach them how to avoid detection in future crimes; and  $\gamma$ , if interacting with antisocial peers changes their preferences regarding legal versus illegal behavior. Other interventions might also affect the form of  $Y$  or  $\tilde{Y}$ , which in turn determine the payoffs from a given amount of human capital (criminal or non-criminal).<sup>13</sup> In other words, most of the parameters and functions above are, in turn, functions of the interventions we might impose on the offender.<sup>14</sup> The net effect of these changes on future behavior is often theoretically ambiguous.

One could imagine a variety of interventions that affect these parameters in different ways. Indeed a wide variety of interventions currently exist; a subset of these have been rigorously evaluated in some form. I organize my discussion of the empirical evidence to consider the effects of changing the punishment for an offense, changing the probability of punishment, changing the outside options, changing peers and preferences, and improving individuals’ ability to make welfare-maximizing choices based on the framework above.

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<sup>13</sup>For instance, bans on occupational licensing for people with criminal records could change production function  $\tilde{Y}$ , resulting in a lower payoff for any given non-criminal capital,  $H$ .

<sup>14</sup>It is possible that interventions could also affect  $\lambda$  – a combination of risk preferences and the discount rate – but I do not know of any work testing this hypothesis.

### 3 Change the punishment

#### 3.1 Increasing the initial punishment

For most people who commit a first offense, it is reasonable to assume that the expected payoff of that crime exceeded the expected cost.<sup>15</sup> But the experience of a criminal punishment may deter future crime, if it is worse than the offender expected. This would cause them to update their beliefs about the disutility of punishment, thereby reducing  $s$ . If this occurs, then we may not need to increase penalties with subsequent offenses in order to achieve desistance from crime; we just need to set  $s$  sufficiently high for the first offense. The idea that the experience of a penalty might change the deterrent power of that penalty going forward is referred to as ‘specific deterrence’ – in contrast with the ‘general deterrence’ value of that penalty for the broader population. On the other hand, punishment may have criminogenic effects. For instance, incarceration could facilitate the building of criminal capital by concentrating offenders in one place, enabling them to network and learn from one another (this is the idea that prison is a ‘crime school’). This would increase  $Y(C)$ . Harsher penalties could also reduce their outside option,  $\tilde{Y}(H)$ . This could happen if skills necessary for non-criminal employment atrophy during incarceration, or if the experience of incarceration results in emotional trauma that makes it more difficult to be productive in the formal labor market. If the punishment is incarceration, an incapacitation effect will reduce opportunities to commit crime while the person is in jail or prison. What do we know about the net effect of increasing  $s$  on recidivism?<sup>16</sup>

There is evidence of specific deterrence in contexts where criminogenic and incapacitation effects are unlikely: that is, where penalties are more likely to be fines or probation than incarceration. These contexts allow relatively clean measures of the specific deterrence

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<sup>15</sup>Section 7 considers the case of offenders who make choices that are not welfare-maximizing, perhaps due to substance use or mental illness.

<sup>16</sup>Increasing the punishment may also have effects on the families and communities of those who are directly punished. Such costs or benefits should also be considered when determining the optimal level and type of punishment. See for example Bhuller, Dahl, Løken and Mogstad, 2018; Billings, 2019; Norris, Pecenco and Weaver, 2020; and Arteaga, 2020.

effects of criminal penalties. Hansen (2015) considers the population of offenders stopped for suspected driving under the influence (DUI) offenses. The punishments for DUI offenses are determined by strict guidelines based on blood alcohol content (BAC). Those with a BAC just above the DUI threshold are penalized, and those with a BAC just above the aggravated DUI threshold receive harsher penalties (in both cases, penalties are typically fines and short jail sentences). Using a regression discontinuity approach based on BAC, Hansen finds that additional criminal penalties reduce subsequent recidivism, at both thresholds. Gehrsitz (2017) exploits a little-known rule in German traffic law that results in a license suspension for individuals with multiple speeding offenses in 365 days. Using that 365-day threshold in a regression discontinuity design, he finds that the license suspension penalty has a specific deterrent effect, reducing the likelihood of reoffending by 20 percent.

A separate literature considers the net effect of incarceration, which will include specific deterrence and incapacitation effects, as well as any criminogenic effects. Mueller-Smith (2015) uses random assignment of offenders across judges, who vary in their propensity to sentence defendants to incarceration, as exogenous variation in a defendants' likelihood of being incarcerated as well as the length of the sentence. He finds that, for those affected by judge assignment (those on the margin of incarceration or a longer sentence) in Harris County, Texas, increasing  $s$  increases the frequency and severity of recidivism, and worsens labor market outcomes. In other words, the criminogenic effects of increasing  $s$  outweighs the specific deterrent and incapacitation effects.

The net impact of increasing  $s$  may depend on the incarceration experience in a particular jurisdiction (relative to the local counterfactual), as well as which types of offenders are on the margin. Others use the same empirical strategy (randomization across judges) but find different results in other contexts: For example, Bhuller, Dahl, Løken and Mogstad (2020) find that increasing  $s$  reduces recidivism in Norway. Green and Winik (2010) find that increasing  $s$  has no effect on recidivism for felony drug offenders in DC. Kling (2006) does not look at recidivism, but finds that increasing  $s$  has no effect on labor market outcomes

in Florida or California. [Aizer and Doyle \(2015\)](#) find that increasing  $s$  increases recidivism for juveniles in Cook County, Illinois, while [Eren and Mocan \(2019\)](#) finds that increasing  $s$  has mixed effects on recidivism for juveniles in Louisiana: it increases future drug crime, reduces future property crime, and has no effect on future violent crime. [Abrams \(2010\)](#) uses randomization across public defenders (who vary in their ability and therefore the average harshness of the penalty their clients receive) to identify the effect of  $s$  in Clark County, Nevada. He finds that increasing  $s$  reduces recidivism, but that the relationship is complicated and non-monotonic.

The judge (or public defender) randomization empirical strategy identifies the effect of incarceration for those whose sentences depend on which judge (or public defender) they're assigned to. The effect of  $s$  might be different for other groups of offenders, and other empirical strategies help shed light on this. [Hjalmarsson \(2009b\)](#) considers the effects of discontinuous increases in  $s$  caused by sentencing guidelines to measure the effect of  $s$  for juveniles in Washington State. She finds that for those near the threshold, increasing  $s$  reduces future criminal behavior. [Mitchell, Cochran, Mears and Bales \(2017\)](#) find that being just over a risk score cutoff results in an increase in  $s$ , and this in turn appears to increase recidivism for felony drug offenders in Florida (while the coefficients are economically meaningful, they are imprecisely measured and the effects are not statistically significant). [Estelle and Phillips \(2018\)](#) exploit discontinuous increases in  $s$  based on sentencing guideline thresholds in Michigan, finding that increasing  $s$  significantly reduces recidivism for some groups (e.g. felony shoplifters) but not others (e.g. repeat drunk drivers). [Loeffler and Grunwald \(2015\)](#) find that, for drug offenders in Chicago, being processed as adults due to being just over the age threshold (age 17) increases  $s$  and reduces the probability of recidivism by 3-5%. They attribute this effect to a combination of incapacitation and specific deterrence, but find substantial heterogeneity within this population.

We do not yet fully understand what drives the differences in effects across contexts. As the evidence from different contexts continues to grow, patterns will surely emerge that will

help us understand when the benefits of increasing  $s$  outweigh the costs.<sup>17</sup>

Another way to increase  $s$  is to make prison conditions harsher. [Drago, Galbiati and Vertova \(2011\)](#) consider the net effect of prison conditions while an offender was incarcerated on their subsequent recidivism. They exploit within-prison variation in prison conditions in Italy to identify the effect. They use two indicators as proxies for harshness: extent of overcrowding, and number of inmate deaths. They also consider the effect of isolation from society, using distance to the nearest major town as a proxy – a longer distance implies higher costs for visits, services by volunteer organizations, job training, and attention to prison conditions by media outlets. Across all of these measures, the authors find suggestive evidence that being incarcerated in a prison when conditions are relatively harsh increases recidivism. Though the effect sizes are small and imprecisely estimated, they are consistent with the hypothesis that the criminogenic effect of harsh prison conditions outweighs the specific deterrent effect in this context.

The framing of punishment may also matter – and in particular there may be downsides to policies that allow individuals to serve much less time than they originally expected, or under better conditions than they expected. [Bushway and Owens \(2013\)](#) argue that discrepancies between recommended and actual sentences can result in important framing effects that affect the disutility of  $s$  and thus the specific deterrent effect of prison. Exploiting a policy change in Maryland as a natural experiment, they find that, conditional on the actual time served, those whose recommended sentences were longer are more likely to recidivate after release. The authors conclude that “large discrepancies between the ‘bark’ and ‘bite’ of the criminal justice system may make incarceration less effective at reducing crime.” That is, an actual  $s$  that is less than offender’s perceived  $s$  could lead to downward adjustment of the expected penalty going forward, and thereby incentivize more criminal behavior.

[Monnery \(2016\)](#) also finds evidence that the anticipated punishment matters in how

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<sup>17</sup>Of course, there are other reasons that we punish offenders. People may value retribution for wrongdoing, such that an offender’s disutility from punishment is given positive weight in a community’s objective function. This review is abstracting from such costs and benefits, to focus on effects on recidivism.

offenders respond to changes in time served. Using data from a collective pardon in France, he finds that offenders who had little experience with such pardons – and thus were unlikely to anticipate the current pardon – are more likely to respond to their sentence reduction with an increase in recidivism. The effects are further concentrated among those who have little time to adjust and prepare for their earlier-than-anticipated release date, and – within that group – among offenders with relatively little human capital. Monnery interprets this result as evidence that preparation for release matters. This has implications for how we interpret mixed results across studies that use different empirical strategies – those that identify effects off of unexpected early releases may be biased toward finding that longer sentences have net benefits.

Diverting low-level offenders from incarceration to less-intensive penalties may facilitate desistance by avoiding the criminogenic effects of incarceration. Electronic monitoring (EM) is a common alternative to incarceration, and allows us to test the net impact of reducing  $s$  without entirely forgoing its incapacitation effect. EM requires individuals to wear GPS or radio frequency monitors that alert law enforcement if they violate location-related terms of their probation or parole (e.g., if they're not at home when a curfew requires it). EM is appealing because it allows offenders to continue working or caring for family members; it may thus be less disruptive than traditional incarceration (limiting any reduction in  $\tilde{Y}(H)$ ). However, if this penalty is less harsh than offenders had expected, it could lead to a counter-productive reduction in the perceived  $s$ . Several studies outside the U.S. have considered the effects of EM as an alternative to short incarceration spells. There are currently no rigorous studies of the effectiveness of EM as implemented in the United States.

di Tella and Schargrotsky (2013) measure the effect of EM (instead of pre-trial detention in jail) for arrestees in Argentina. Using randomization of arrestees across judges with different propensities to pre-trial detention versus EM as a natural experiment, they find that EM reduces the likelihood of being re-arrested by 48%. This suggests that the harsh jail conditions in Argentina have a strong criminogenic effect that substantially outweighs

any specific deterrence and incapacitation effects. [Henneguelle, Monnery and Kensey \(2016\)](#) measure the effect of EM as an alternative to short prison sentences (those less than one year) across courts in France. They exploit the gradual rollout of EM as a natural experiment, finding that EM reduced the likelihood of another conviction by 9-11%. Two other studies consider the effects of large expansions of EM in Denmark. EM became available as an alternative to incarceration for offenders sentenced to 3 months or less. The policy change meant that otherwise-similar people sentenced just before and after the EM expansion dates had very different likelihoods of serving their sentence on EM instead of in prison. [Andersen and Andersen \(2014\)](#) found that being assigned to EM reduced the likelihood of welfare receipt by 20% during the year after release, but only for young offenders (age 25 or under). [Larsen \(2017\)](#) found that EM, which was paired with a work or education requirement, increased young offenders' secondary school completion by 43%. Neither study considered effects on recidivism; such an analysis would be valuable.

Finally, increasing the intensity of community supervision (probation and parole) is, at least in part, a punishment. Studies of this type of intervention find null or detrimental effects on subsequent behavior. See the full discussion in Section 4 below.

### 3.2 Graduated sanctions

For those who do not desist from crime after the first conviction and punishment, we could encourage desistance by increasing  $s$  for subsequent offenses. That is, we could implement graduated sanctions.<sup>18</sup>

[Harrell and Roman \(2001\)](#) consider the effects of a “coerced abstinence program” for drug felony defendants in Washington, DC, in the mid-1990s. Pre-trial defendants with repeated failed drug tests received drug testing and judicial monitoring; a subset were randomly assigned to a program with structured graduated sanctions for failed drug tests. This program emphasized “(1) the clarity of the agreement to the defendant, (2) the consistency with which the sanctions were applied (certainty), (3) the immediacy (celerity) of the penalty, and (4)

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<sup>18</sup>Graduated sanctions could also have the benefit of increasing deterrence for the initial offense. See [Polinsky and Shavell \(1998\)](#) and [Polinsky and Shavell \(2000\)](#).

increasing severity of penalties for successive drug test failures” (Harrell and Roman, 2001). This program has many similar features to those of HOPE and related programs, discussed in Section 4 below. But in this case, the probability of punishment,  $p$ , was held constant across treatment conditions, so the experiment isolated the effect of the graduated sanctions ( $s$ ) component. An intent-to-treat (ITT) analysis showed no effect of being assigned to graduated sanctions on the number of arrests for new charges during the year after sentencing; coefficients were near-zero and statistically insignificant.<sup>19</sup>

Increasing  $s$  for subsequent offenses may be more effective in other contexts. For a population of Italian offenders released due to a large collective pardon, where time not served due to the pardon was commuted to a sentence enhancement for any subsequent offenses, Drago, Galbiati and Vertova (2009) estimate that the elasticity of recidivism with respect to  $s$  is -0.74 for a seven-month period. (However, as noted in Durlauf and Nagin, 2011, since the sentence enhancement was equivalent to the reduction in their previous sentence, this result is also consistent with the hypothesis that increasing the initial time served had a net criminogenic effect.) Similarly, Mueller-Smith and Schnepel (2020) find that a court deferral program in Texas that, among other features, increased  $s$  for subsequent offenses, reduced subsequent recidivism. (Though see further discussion of this study in Section 3.3 for alternative mechanisms.)

Over the past several decades, many jurisdictions have implemented habitual offender laws that harshly punish serial offenders. Most analyses of these laws focus on their effects on local crime rates – that is, how much does crime fall when repeat offenders are locked up? However, Helland and Tabarrok (2007) focus on the effects of such laws on the behavior of individual offenders. Using California’s three strikes law, which mandated life sentences for individuals with three qualifying offenses, they compare recidivism rates for offenders convicted of a qualifying offense, relative to those charged with such an offense but convicted

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<sup>19</sup>Not all individuals assigned to the graduated sanctions program opted to participate. A treatment-on-the-treated (TOT) analysis, using assignment as an instrument for participation, would have been valuable but was not included.

of a non-qualifying offense. They find that California’s three strikes law reduced felony arrests by offenders with two strikes by 17-20 percent. However, the large penalty for even relatively minor third-strike offenses may have unintended consequences. In particular, it incentivizes offenders to commit more serious offenses that would not affect the penalty but could reduce the probability of getting caught – for instance, killing potential witnesses. In line with this hypothesis, [Marvell and Moody \(2001\)](#) find that three strikes laws increase homicide rates.

Focused deterrence programs target known offenders with a “carrot and stick” approach: making it clear that future offenses will receive harsh penalties, while offering assistance (access to services and community support) if offenders choose to desist from crime. Such programs thus increase  $s$  for subsequent offenses, and simultaneously aim to increase  $\tilde{Y}(H)$ . Many studies have considered the effects of such programs using matched comparison groups, where selection bias is a primary concern. [Hamilton, Rosenfeld and Levin \(2018\)](#) consider a randomized controlled trial (RCT) of a focused deterrence program. They randomly assign eligible individuals ( $N=106$ ) to receive an invitation to a focused deterrence notification meetings (where the carrot and stick were explained). About two-thirds of those invited attended the meetings. ITT and TOT analyses are underpowered: while coefficients suggest that attending the meeting reduced the likelihood of being rearrested, effects were not statistically significant and the study cannot rule out large detrimental effects. Repeating this experiment with larger samples would be informative.

### 3.3 Collateral consequences

Direct criminal penalties such as fines and incarceration are not the only penalty faced by offenders. Individuals convicted of a crime may also face a large number of indirect punishments that contribute to  $s$ . So-called ‘collateral consequences’ of a criminal conviction include things like being barred from particular occupational licenses or employment in specific industries, as well as bans on various forms of public assistance.<sup>20</sup> Some of these collateral consequences go into effect with the first offense and do not escalate with subse-

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<sup>20</sup>The phrase ‘collateral consequences’ is typically attributed to [Mauer and Chesney-Lind \(2002\)](#).

quent offenses. This means that, for the population of offenders of interest in this review,  $s$  is lower than it was before they committed their first offense. (If they are already barred from certain jobs or types of support, they cannot be barred again.) However, in other cases collateral consequences apply during specific time periods after a relevant conviction, so that subsequent convictions can extend or reinstate this indirect penalty.

Existing studies of collateral consequences measure the net impact of any change in the deterrent effect and the reduction in economic well-being that such penalties entail. On average, those convicted and incarcerated for crimes face substantial economic hardship, and struggle to make ends meet after release from prison (Harding, Wyse, Dobson and Morenoff, 2014). Collateral consequences that reduce financial support or potential earnings may substantially exacerbate this challenge. In practice it is difficult to disentangle the effect of  $s$  from this effect on  $\tilde{Y}(H)$ . As discussed further in Section 5.5, there is growing empirical evidence that policies that reduce public assistance available to people with criminal records increase recidivism. This effect may be due to the combination of the reduction in  $s$  and the reduction in  $\tilde{Y}(H)$ .<sup>21</sup>

Diversion programs that allow first-time offenders to avoid a criminal conviction could reduce the collateral consequences of their offense. This maintains the threat of future collateral consequences for subsequent offenses. Mueller-Smith and Schnepel (2020) study the effects of court deferrals in Harris County, Texas. Court deferrals allow felony defendants to avoid a formal conviction through probation. It also increases the penalty for reoffending, as the offender would receive sentences for both the initial and new offenses if they commit another crime while on probation; this increase in the penalty could have a deterrent effect, as discussed above.

Two events in Harris County created natural experiments where there was a sudden

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<sup>21</sup>The social stigma associated with a criminal record can have same effects as more formal collateral consequences. In addition, making individuals' criminal identity salient – through social stigma or official policies – can increase criminal behavior, even without a direct effect on material well-being. Cohn, Maréchal and Noll (2015) conduct an experiment with prison inmates, finding that exogenously increasing the salience of their criminal identity increased the likelihood of cheating. This measure of cheating correlates with inmates' prison infractions.

change in the number of low-risk and non-violent felony defendants granted a court deferral. Before and after those events, otherwise-similar defendants received different outcomes (a felony conviction versus a court deferral) that allowed the researchers to measure the causal effect of this type of diversion program on defendants' outcomes. They found that first-time felony defendants benefited greatly from diversion: for this group, court deferrals reduced subsequent recidivism and increased the likelihood of employment. Defendants with previous convictions did not benefit from court deferrals, suggesting that avoiding a first felony conviction (and the associated collateral consequences) – rather than increasing the punishment for a reoffense or simply avoiding the criminogenic effect of prison – is the key to this program's success in encouraging desistance from crime.

#### **4 Change the probability of punishment**

Increasing  $p$ , the probability of punishment, changes the expected payoff from committing crime to more heavily weight the cost of punishment,  $s$ , which in turn reduces the expected payoff from committing crime. In addition, for offenders who heavily discount the future, increasing  $p$  may have a bigger effect on behavior than increasing the penalties does. This is because increases in  $s$  typically won't be realized until far into the future (e.g. adding a year to a 5-year sentence does not affect utility until the sixth year).

There are several ways to increase  $p$  for the broader population: hire more police officers and investigators focused on solving crimes, install more surveillance cameras, and so on. Other policies aim to increase  $p$  specifically for individuals who already have a history of criminal justice involvement, thus seeking to achieve desistance rather than general deterrence.

DNA databases provide a particularly clean test of the impact of  $p$  on recidivism. Every state in the United States, as well as many countries around the world, maintain databases of known offenders' DNA profiles. State law governs which groups of offenders (e.g., violent convicts, property convicts, misdemeanor convicts, felony arrestees) are required to provide a DNA sample to law enforcement. That sample is analyzed to create an identifying string

of numbers that is then uploaded to the database and compared with numbers identifying DNA samples from crime scenes. When a match is made, the offender is identified as a possible suspect in the crime and their information is sent to local law enforcement.

Two studies consider the impact of adding someone to the DNA database on that person's subsequent recidivism. They both exploit database expansions as natural experiments. [Doleac \(2017\)](#) considers a variety of state-level expansions within the United States, all focused on adding groups of felony convicts (e.g., expanding from only homicide convicts to other violent convicts, then burglary convicts, and so on). These expansions create situations where someone released from custody on one day is not added to the database, but an otherwise-identical person released the next day (the legislated expansion date) is added to the database. The study finds that violent offenders released after the expansion date are 17% less likely to be incarcerated again within the next five years (statistically significant), and property offenders are 6% less likely to be incarcerated again (marginally significant), relative to similar offenders who were released just before the expansion. These reductions in re-incarceration are particularly striking given that individuals in the DNA database are *more* likely to get caught for any offenses they do commit. These estimates are therefore likely to be underestimates of the true deterrent effects of DNA databases.

[Anker, Doleac and Landersø \(2019\)](#) use a similar natural experiment in Denmark, along with a richer dataset, to measure the effect of adding people charged with felonies to the DNA database in that country. The intuition is the same as before: Those charged the day before the policy change were not added to the database, while those charged with the same crime the next day were added to the database. In addition, this study uses detailed information on the timing of subsequent offenses and convictions to separate the deterrent and detection effects of DNA. The authors find that being added to the DNA database reduces recidivism by a statistically-significant 42% in the first year after the charge; that effect persists for at least three years, and is strongest for those charged with violent offenses. They estimate that the elasticity of new crimes with respect to the probability of getting caught is -2.7,

among those who have previously been charged with a felony.

Both studies provide strong empirical evidence for the theoretical prediction that increasing  $p$  can encourage desistance from crime. Other policies that may work in part by increasing  $p$  also change other factors that could confound that effect.

Increasing community supervision for those on probation and parole may affect criminal behavior in part by increasing  $p$ . Such supervision typically involves drug tests, frequent meetings, and attention to whether the individual is where he is supposed to be and staying out of trouble. At the same time, probation and parole officers have a great deal of discretion about when to penalize someone under their supervision, and so  $p$  may not be clear to the person being supervised. Experiencing intensive supervision, itself a penalty ( $s$ ), may have a specific deterrence effect, but intensive supervision may also act as a tether to the criminal justice system that makes it more difficult to envision and pursue a different life (which may have the effect of reducing perceived  $\tilde{Y}(H)$ ). This may counteract any beneficial effects of supervision. Indeed, a long list of studies now show that increasing the level of supervision for probationers and parolees either has no impact on the likelihood of committing new offenses (Turner, Petersilia and Deschenes, 1992; Turner and Petersilia, 1992; Lane, Turner, Fain and Sehgal, 2005; Barnes, Hyatt, Ahlman and Kent, 2012; Boyle, Ragusa-Salerno, Lanterman and Marcus, 2013; Georgiou, 2014; Hyatt and Barnes, 2017), or increases recidivism (Hennigan et al., 2010; Lee, 2019).

Many programs target substance abuse, in part because testing can easily increase  $p$  for those who are not supposed to be using drugs or alcohol.

An RCT of various frequencies of drug testing for high-risk, young parolees in California found that being randomly assigned to more frequent testing had no significant impact on re-arrests; those assigned to high-testing groups had higher rates of violent arrests on average (Haapanen and Britton, 2002). However, implementation of the assigned frequency of drug testing was poor, so it is unclear whether participants perceived the probability of punishment as differing across the groups. A subsequent study by Kilmer (2008) aggregated the subjects

into two groups: those assigned to no drug testing or to some drug testing. He also used random assignment as an instrument for whether drug tests were actually administered, to measure the TOT effect. He found that drug testing dramatically increased the likelihood of being employed or in school during the first 30 days of parole. Effects on recidivism were not measured. There was substantial heterogeneity by race: drug testing had no effect for black parolees, but had very large effects for Hispanic parolees.

Swift, certain, and fair (SCF) sanction programs typically target probationers and parolees whose substance use is viewed as a driver of their criminal behavior. For these individuals, sobriety is a condition of community supervision. However, as noted above, detection and punishment,  $p$ , for violating these conditions can be inconsistent in practice. Often, offenders fail drug tests but are not punished consistently, and when they are (occasionally) punished, the penalty,  $s$ , is severe (e.g. revocation of parole). SCF programs offer a new model, focused on swift, certain, and fair (modest) sanctions in response to substance abuse. Programs typically involve frequent, random drug tests, where a failed test is met with an immediate, short sanction (e.g., a night or two in jail). The goal is to induce behavioral change through clear expectations and consistent responses to breaking the rules – a focus on increasing  $p$  while also dramatically reducing the associated penalty,  $s$ . Proponents argue that reducing  $s$  has little effect in practice because targeted offenders typically have high discount rates. This would imply that the increase in  $p$  is the most important element of these programs, but the net effect is an empirical question. This model assumes that those who abuse drugs or alcohol still respond to changes in  $p$  in a rational way; critics of these programs point out that learning to manage addiction likely requires meaningful treatment, not a simple change in incentives. Prospect theory also highlights the difficulty people have in estimating and interpreting probabilities in practice (Cook, 2016). It is therefore unclear how many people would change their substance use in response to a change in  $p$  alone.

One of the first studies evaluating this model in the context of reducing substance use was an RCT of HOPE in Hawaii. Hawken and Kleiman (2009) compared individuals ran-

domly assigned to HOPE with those who received probation as usual. Eligible probationers included (but were not limited to) individuals with a documented substance abuse problem. Twelve months after assignment, probationers in the treatment group had spent significantly less time incarcerated than those in the control group. The success of this program prompted many other jurisdictions to implement HOPE-style models. Results of subsequent replication studies in other jurisdictions have been somewhat mixed (Hawken and Kleiman, 2011; Grommon, Cox, Davidson and Bynum, 2013; Hawken et al., 2016; Lattimore et al., 2016; Davidson, King, Ludwig and Raphael, 2019).<sup>22,23</sup> It's possible that the success of HOPE was due to the particularly charismatic judge who led the program. It's also possible that this type of program – which relies primarily on drug tests to determine violations of supervision requirements – will be most effective for people for whom substance use is a problem.<sup>24</sup> Most of the studies of this type of program include participants who do not have histories of substance abuse. Testing for differential effects across those with and without evidence of prior substance abuse could shed light on which populations (if any) benefit from this type of intervention. Some of these studies were underpowered, so a meta-analysis that combines the data from the RCTs on this topic would also be useful.

Kilmer, Nicosia, Heaton and Midgette (2013) evaluated another SCF program in South Dakota called 24/7 Sobriety. The program requires individuals arrested for alcohol-related

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<sup>22</sup>O'Connell, Brent and Visser (2016) consider an RCT of a similar program (participants: high-risk probationers with a failed drug test), but the analysis controls for participants' employment, which itself appears to be an outcome of treatment. This could bias the estimates. Doleac, Temple, Pritchard and Roberts (2020) reanalyzed the data in this study and found suggestive evidence that the SCF program reduced recidivism, but the estimates were too imprecise to draw clear conclusions.

<sup>23</sup>Another difference between these studies is the populations included. Hawken and Kleiman (2009) and Hawken et al. (2016) included 493 high-risk probationers. Substance use was not a criterion for inclusion. Hawken and Kleiman (2011) included 70 parolees of all risk levels, including those with serious criminal histories. Substance use was not a criterion for inclusion. Grommon, Cox, Davidson and Bynum (2013) included 511 high-risk parolees with substance dependencies. Lattimore et al. (2016) included 1504 medium- and high-risk probationers across four sites. Substance use was not a criterion for inclusion. Davidson, King, Ludwig and Raphael (2019) included 190 pre-trial felony defendants. Substance use was not a criterion for inclusion. It is unclear what share of participants in the studies where substance use was not a criterion for inclusion had a problem with drug or alcohol abuse.

<sup>24</sup>Alternatively, those who are addicted to drugs or alcohol may not respond to incentives in a rational way. The ideal participant may be someone whose substance use gets them into trouble but does not rise to the level of addiction.

offenses to take a breathalyzer test twice per day or wear an alcohol-monitoring bracelet that continuously checks whether the person has been drinking. This dramatically increases  $p$ . If someone tests positive for alcohol consumption, they receive swift, certain, and modest sanctions. This program was gradually phased in across counties in South Dakota, allowing a difference-in-differences analysis. Trends in places that adopted 24/7 Sobriety were compared with trends in places that had not yet adopted the program. The researchers found that adoption of the program caused a 12% reduction in repeat DUI arrests and a 9% reduction in domestic violence arrests. Both effects were statistically significant. A follow-up study found that 24/7 Sobriety also caused a significant reduction in deaths (Nicosia, Kilmer and Heaton, 2016).

All told, the literature provides strong support for the hypothesis that increasing  $p$  can encourage desistance from crime. However, many programs that increase  $p$  also change other parameters, and these could counteract any beneficial effects. In addition, changing  $p$  is likely to be more effective for some groups than others, and we do not yet understand heterogeneity by offender or crime type.

## 5 Change the non-criminal outside option

Given particular expected benefits of criminal behavior, we could deter future crime by increasing the expected utility from the alternative,  $\tilde{Y}(H)$ . The most obvious way to do this is to increase legal employment and earnings. This could reduce criminal behavior in three ways: (1) Direct substitution of legal income for illegal income – that is, if someone is earning enough money through legal employment, they will have less incentive to commit crime for monetary gain. (2) Legal employment can change how individuals spend their time, in a way that results in less crime (e.g. less use of drugs and alcohol, or going to bed earlier on work nights). (3) Legal employment may change the composition of a person's peer group, in a way that improves behavior due to positive peer effects. If (1) is a driving factor, then we would expect beneficial impacts to increase with the level of pay, and financial assistance that is not tied to work may be equally effective. If (2) is important, then any job should

have beneficial effects, but financial assistance that does not require work may not. And if (3) matters, then facilitating access to ‘standard’ private sector jobs should be more effective than employment interventions that group hard-to-employ individuals together (e.g. ‘jobs of last resort’ programs).

Raphael and Weiman (2002) find that those released from prison at a time when local unemployment rates are relatively low reduces recidivism. This suggests that access to employment encourages desistance from crime. But macroeconomic improvements are difficult to engineer. Are there other ways to improve employment outcomes for those with criminal records?

Employment-focused interventions targeting this group have received a great deal of attention from researchers and policymakers – perhaps more than any other type of intervention in the prisoner reentry context (see Raphael, 2011, and Doleac, 2016 for two reviews). There are a few ways we might approach increasing legal employment and earnings. One is facilitating and incentivizing investment in human capital, through education and job training. Such programs might target hard skills (job-specific skills such as plumbing or typing) or soft skills (reliability, anger management, interpersonal skills). Another approach would be to increase the wages of those who are already employed. Alternatively, we might improve access to employment for those who already have sufficient skills to be a productive employee. For those who are not yet work-ready, services that address individuals’ varied needs (related to health, housing, child care, transportation, etc.) could provide important complements to employment. Providing those complements might then be an effective way to increase work-readiness and non-criminal work options. And finally, we might provide financial or in-kind assistance that is not directly tied to work.

## **5.1 Facilitate and incentivize investment in human capital**

Low productivity (and thus low potential non-criminal wages) could be due to limited education, job training, and job experience. Interventions aimed at increasing human capital might include training to improve hard and/or soft skills.

One approach to increasing human capital is providing hard-to-employ groups (including people recently released from prison) with transitional jobs. These are paid employment opportunities with the goal of helping participants transition into private sector jobs at the end of the program. The jobs provide legal income – typically minimum wage – and are designed to train participants in soft skills such working as part of a team, interacting productively with a supervisor, and showing up on time every morning, ready to work. They might be expected to reduce recidivism both by providing a steady (albeit low) income as well as by improving human capital.

Uggen (2000) and Uggen and Shannon (2014) use data from that National Work Demonstration, which took place across nine U.S. cities in the late 1970s. A random subset of individuals with histories of heavy substance abuse and criminal records were offered a job for 18 months. The jobs were typically in construction or manufacturing, and individuals worked in crews alongside other drug-involved program participants. Being randomly assigned to receive a job increased employment and reduced recidivism, but only for older men (age > 26). There was no effect on self-reported drug use, but being assigned to the treatment group did reduce self-reported arrests for financially-motivated crimes like burglary and robbery. However, outcomes were self-reported and the sample suffered from substantial attrition.

More recent studies of transitional jobs programs use RCTs with administrative data on employment and recidivism to increase accuracy and avoid sample attrition. In general, these evaluations (which place participants in jobs with non-profit organizations, typically for six months) find that those in the treatment group – that is, those offered a transitional job – show up at those jobs and work. They are substantially more likely to be employed during the program than those in the control group are. However, once the program ends, the treatment group's employment rate quickly falls, and in the end there is little or no long-term benefit in terms of employment outcomes. Most programs also find little to no impact – during the program or after it ends – on recidivism (Cook et al., 2015; Valentine

and Redcross, 2015; Barden et al., 2018).<sup>25</sup> Unfortunately, these studies show that simply giving someone a job does not reliably encourage desistance. This suggests that (1) earnings were too low to substitute for illegal income, and/or (2) participating in a program with other offenders introduces negative peer effects that may counteract any beneficial effects of human capital investment.<sup>26</sup>

There is currently little evidence on the effect of vocational programs or similar job-training programs. Farabee, Zhang and Wright (2014) describes an employment-focused reentry program for individuals who were recently released from jail or prison. The program offers vocational training and job-readiness training, but an RCT evaluation found no impact on subsequent employment or recidivism. This suggests that either the training was not effective at increasing human capital, or that it was not enough to overcome other barriers to employment for people with criminal records. Schaeffer et al. (2014) compared high-risk juvenile offenders with (or at risk of developing) substance abuse problems randomly assigned to a vocational construction program (Community Restitution Apprenticeship-Focused Training, CRAFT) versus education as usual. They find that the program improved self-reported likelihood of employment during a 30-month followup period, but had no effect on the likelihood or frequency of new arrests (based on administrative data).

Incarceration provides an opportunity to intervene in an offender's life with programs that individuals might not voluntarily engage in otherwise. There is some evidence that prison-based interventions can be successful. For instance, Landersø (2015) finds that a Danish policy reform that extended incarceration spells by one or two months improved

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<sup>25</sup>A notable exception is the RecycleForce program targeting high-risk individuals in Indianapolis; this was the only one of seven Enhanced Transitional Jobs Demonstratoin (ETJD) programs that found beneficial effects on employment and recidivism. It is also the only program where participants were hired directly by a private (social enterprise) employer and could be kept on for longer than the original period (Barden et al., 2018). That is, these jobs may not have been perceived as temporary, and the provider had direct control over participants' outcomes. This program also provided many additional supports such as debt relief and education.

<sup>26</sup>A separate literature considers the effects of Individual Placement and Support (IPS), which provides employment for people with mental illness. For instance, Poremski, Rabouin and Latimer (2017) use an RCT to measure the effect of IPS on people with mental illness, a criminal record, and a history of homelessness. They found that those assigned to IPS are more likely to find employment during the program period, but effects on recidivism and long-term employment are not considered.

subsequent employment outcomes. While this could be due to a specific deterrence effect, he hypothesizes that longer incarceration spells provide more opportunity and incentive to participate in rehabilitation programs. This hypothesis is in line with [Kuziemko \(2013\)](#), who finds that when Georgia eliminated the opportunity to receive parole due to good behavior, inmates reduced their participation in rehabilitative programming and subsequent recidivism increased. This suggests that the programs themselves had been successful at encouraging desistance from crime, presumably by increasing  $\tilde{Y}(H)$ .

Bootcamp programs in prison aim to improve soft skills such as reliability, self-control, and ability to work in a team. [Bierie \(2009\)](#) discusses an RCT comparing a 6-month ‘early-release’ bootcamp program in Maryland as an alternative to prison. The bootcamp involves several differences from traditional prison: (1) a more highly-structured environment, (2) heavy emphasis on rehabilitation and education programming, (3) low-risk, first-time offenders as peers, (4) slightly longer incarceration spells, and (5) higher likelihood of being assigned to intensive community supervision upon release. The cost of the bootcamp program was lower per day than the cost of traditional prison. In addition, those assigned to the bootcamp program had lower recidivism rates than those assigned to traditional prison, but – given the multiple differences between the boot camp and incarceration as usual – it is unclear what is driving that effect. [Bottcher and Ezell \(2005\)](#) compares a bootcamp program plus intensive parole in California with traditional custody and parole, for nonviolent juvenile offenders. Three years later, those in the bootcamp group had 0.081 (3%) fewer arrests, but this effect was not statistically significant. There was no cost-benefit analysis.

Prison facilities offer a variety of educational programs, including GED and post-secondary courses, though the extent and quality of programming varies. There is currently very limited evidence on the effect of educational programs on desistance. Economic theory predicts that increasing education should reduce future offending by increasing  $\tilde{Y}(H)$ , but the magnitude of this effect is important for determining whether such interventions are cost-effective and for whom. There may be other barriers that prevent participants from realizing returns

on their educational investments, and it will be important to understand these dynamics. Bozick, Steele, Davis and Turner (2018) review a large set of studies that suggest beneficial effects, but these studies are typically based on matched comparison groups where the treatment groups are positively-selected. Future work exploiting natural experiments or field experiments that avoid selection bias would be valuable for determining the power of educational programs – alone or in combination with other interventions – to encourage desistance from crime.

## 5.2 Increase legal earnings

Cook et al. (2015) note that even the top of the distribution of wage-earners in the transitional job program they studied earned very little.<sup>27</sup> Low wages might explain the ineffectiveness of such programs. Offenders might need not just any job, but a good, well-paying job, to incentivize them to leave illegal activities behind. This would be consistent with the findings of Schnepel (2018) and Yang (2017b): like Raphael and Weiman (2002), both studies find that being released into strong low-skilled labor markets reduces recidivism, but both emphasize that good jobs (those with high wages) drive this effect.<sup>28</sup>

If the level of pay is important, then we might consider directly increasing earnings for those who are able to find a job, either through an increase in the minimum wage or through government wage subsidies. Increasing the minimum wage has several potential effects, such that the anticipated net effect on desistance is ambiguous. If those on the margin of employment are less likely to get a job when the minimum wage is higher, then a minimum wage increase could reduce legal employment (and thereby reduce desistance) for people with criminal records. However, if people with records who are already employed make more money, this could reduce their criminal activity by increasing  $\tilde{Y}(H)$ . In addition, a higher

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<sup>27</sup>The median treatment group member earned \$2,690 over months, while those at the 75th percentile earned \$6,525, and those at the 95th percentile earned \$14,810. In the control group, the median person earned \$462, those at the 75th percentile earned \$4,000, and those at the 95th percentile earned \$13,743. All numbers are in 2009 dollars.

<sup>28</sup>Another potential explanation for the difference between the effect of strong low-skill labor market and transitional jobs programs is that strong local labor markets may help the friends and family of those who are released from prison, putting them in a better position to support offenders when they are released.

minimum wage might draw higher-skill offenders into the formal labor market, incentivizing them to forgo criminal activity for legal employment.

Two studies measure the net impact of these effects. [Beauchamp and Chan \(2014\)](#) use data from the National Longitudinal Study of Youth (NLSY). They find that, for individuals employed at the minimum wage the year before a minimum wage increase, and with a history of gang affiliation (a proxy for a criminal record), minimum wage increases reduced self-reported employment and increased self-reported criminal behavior. [Agan and Makowsky \(2018\)](#) use a much larger panel of administrative data, from the National Corrections Reporting Program, to measure the net effects of minimum wage increases (up to \$9.50 per hour) on recidivism for all newly-reduced offenders. They find net benefits: A 1% increase in the minimum wage reduces the likelihood of returning to prison within a year of release by 0.05 percentage points (29%). This effect is driven by a reduction in property and drug offenses. The authors are not able to measure effects on employment, so it is unclear whether these benefits are driven by increased earnings for those who were already employed (including friends and family of those with criminal records), or by drawing new people into the legal labor force.

Wage subsidies such as the Earned Income Tax Credit (EITC) avoid any disemployment effects that the minimum wage may have for vulnerable populations who find it difficult to find a job in the first place. [Agan and Makowsky \(2018\)](#) also measure the effect of the EITC on recidivism, and find even bigger effects, dollar-for-dollar: they estimate that “between \$159 and \$279 per year in additional income via the EITC corresponds to the same expected reduction in female recidivism as a \$1,000 worth of additional (full-time) income via an increase in the minimum wage.” (Because the policy currently targets individuals with dependent children, the recipients are primarily women; while effects for men may be similar, such prediction would involve substantial out-of-sample extrapolation.)

This result suggests that expanding the EITC, particularly for those without dependent children, could be a cost-effective way to encourage desistance from crime. A recent RCT

evaluating Paycheck Plus – a pilot of an expanded EITC program – found the largest employment benefits for relatively disadvantaged men (Miller et al., 2018). However, there is not yet evidence on the effects on desistance from crime.<sup>29</sup>

When considering ways to supplement wages, it is also important to consider current policies that tax already-low earnings. Many individuals with criminal records have large court debts and child support arrears. Both types of debt can lead to the garnishment of legal wages, which disincentivizes legal employment. In this way, such policies may counteract attempts to increase legal earnings. This could make desistance more difficult to achieve.

### 5.3 Increase access to legal employment

Increasing legal-sector wages will only increase earnings for those who are able to find a job. However, finding a job can be difficult for those with criminal records. Audit and correspondence studies have shown that employers discriminate against this group, even when all other observable characteristics are the same (Pager, 2003; Agan and Starr, 2018).

Doleac (2016) discusses several possible reasons that employers may be reluctant to hire people with criminal records, and argues that addressing employers' concerns is a crucial first step to designing interventions that increase employment for this group. One issue highlighted there is employers' concerns about legal liability. If they hire someone with a criminal record, and that person goes on to commit another crime on the job, the employer may be subject to a negligent hiring lawsuit or simply bad press that could put them out of business. In the face of even a small probability of such a catastrophic event, rational employers may prefer to hire job applicants without criminal records whenever possible. Interventions that provide clarity about who is a legal risk and who is not, or that shift the risk from employers to government or non-profits, may be particularly effective at increasing employment opportunities for this group.

Existing interventions aimed at increasing access to legal employment include policies

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<sup>29</sup>Studies focusing on employment as an outcome may detect shifts from the informal labor market (e.g. being paid under-the-table in an otherwise legal job such as construction) to the formal labor market. While such a shift may be socially desirable, it does not necessarily imply an increase in economic well-being.

such as Ban the Box, which prohibits employers from asking about applicants' criminal records until late in the hiring process (typically after a conditional offer has been made). Since these policies don't address employers' concerns about hiring people with criminal records, it might lead to statistical discrimination against groups that contain a large share of people with records. [Agan and Starr \(2018\)](#) and [Doleac and Hansen \(2020\)](#) provide evidence that this does, in fact, occur. The result appears to be a net decline in employment for young, low-skilled black men; [Doleac and Hansen \(2020\)](#) estimate that Ban the Box reduced employment for this group by 5%.<sup>30</sup> Other studies find that Ban the Box does not even increase employment for people with criminal records ([Rose, 2020](#); [Jackson and Zhao, 2017](#)).<sup>31</sup> Using administrative data from the National Corrections Reporting Program, [Sherrard \(2020\)](#) finds that BTB increases re-incarceration rates for blacks recently released from prison, but had no effect for whites.

An example of how how addressing employers' concerns can be successful is the following: Some jurisdictions offer court-issued rehabilitation certificates to individuals with criminal records. These certificates may convey additional information about an applicant's work-readiness, above what is available in a job application. They also carry some protection from negative publicity and legal liability if the applicant does go on to commit another crime. In other words, these rehabilitation certificates shift the risk involved in hiring someone with a criminal record from the employer to the court. Two correspondence studies in Ohio have

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<sup>30</sup>[Marchingiglio \(2019\)](#) finds that BTB increases the likelihood that black men obtain an occupational license as a way to signal their clean records to employers; in a sense they thereby "buy back the box" that BTB policies removed.

<sup>31</sup>These studies use administrative data from Washington state and Massachusetts, respectively. [Rose \(2020\)](#) finds no effect of BTB in Seattle on employment people with criminal records. [Jackson and Zhao \(2017\)](#) finds that BTB reduced employment for people with criminal records. A shortcoming of these studies is their local focus. [Craigie \(2020\)](#) uses nationally representative data from the NLSY to measure the effect of BTB on people with criminal records, specifically focusing on government employment. She finds evidence that government employment increased for this group, but the sample was small and – unlike in the Washington and Massachusetts studies – criminal histories were self-reported. [Doleac and Hansen \(2020\)](#) also test for differential effects by employment type and find net *reductions* in black employment in government jobs, but note that considering any industry in isolation could be misleading. Job-seekers are likely to target their search efforts at industries that appear to be most welcoming; if an increase in government jobs appears alongside a reduction in private-sector jobs, it would not be clear if those individuals are better off. The policy-relevant question is whether those who want a job are employed at all.

shown that applicants with rehabilitation certificates are just as likely to get a callback from employers as applicants with no record at all; they are also more likely to have access to housing (Leasure and Martin, 2017; Leasure and Stevens Andersen, 2016). Future work measuring the effect of such policies on recidivism would be valuable.

Reducing restrictions on who is eligible for occupational licenses and employment in particular fields could also increase access to employment for people with criminal records. Denver (2017) and Denver, Siwach and Bushway (2017) find suggestive evidence that reducing the barrier to employment in healthcare for people with criminal records in New York State reduced the likelihood of rearrest, particularly for men.<sup>32</sup> At the same time, expanding eligibility for occupational licenses could have unintended consequences if employers are currently viewing such licenses as a signal of the lack of a criminal record (Blair and Chung, 2018). Additional evidence on the effects of related policy changes on those with and without criminal records would be valuable.

Simple job placement services may not be effective if employers are reluctant to hire applicants with a criminal record.<sup>33</sup> However, increasing the salience of available jobs may still be beneficial. Galbiati, Ouss and Philippe (2020) exploit variation in news coverage of positive or negative shocks to local employment opportunities (e.g. a factory opening or closing), holding constant the actual number of jobs available at the time. They find that positive news in the period just after someone's release from prison (when they might be considering their own prospects and making a plan for the future) reduces recidivism. Negative news during this period has no effect – perhaps because this does not update individuals' priors about the difficulty of finding a job. News just before release (which would not be accessible inside the prison) also has no effect, suggesting that the effect on recidivism is unlikely to be due to friends' and family members' employment. This study

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<sup>32</sup>The sample in these studies was restricted to individuals who had applied for jobs at the relevant employers despite the legal barrier to employment, and it is unclear how representative those samples are of the broader population.

<sup>33</sup>For instance, the program evaluated by Farabee, Zhang and Wright (2014) provided extensive employment placement services. Despite this focus on placing individuals in jobs, the authors found no significant differences between the treatment and control groups in terms of likelihood of employment or re-incarceration.

suggests that, when it comes to economic opportunity, a sense of hope increases perceived  $\tilde{Y}(H)$  and has an independent effect on desistance from crime. Increasing the salience of available jobs can be effective way to increase hope.

## 5.4 Support complements to employment

People leaving jail and prison face a variety of challenges that make it difficult to transition to a law-abiding life. There may be complementarities between distinct interventions that aim to improve someone's non-criminal outside option. For instance, in order to be a productive employee, one needs: the requisite education and job-specific skills, to show up on time every day (which requires both personal discipline and reliable transportation), to be sober (which requires a sobriety plan), child care, and employers who are willing to give them a chance despite their criminal record. Attaining a subset of those may not have any effect on employment or recidivism; all may be required to see beneficial effects.

On the other hand, holistic approaches to rehabilitation may be less effective than more targeted interventions. It is more difficult to do many things well than to do one thing well, and so programs may be more effective when providers focus on their comparative advantage. Alternatively, it could be that lots of meetings and assistance serve as a tether to the system, making it more difficult for those who are ready to move on to do so. It could also be that extensive assistance conveys the message that someone needs extensive help in order to do be successful, thus reducing their confidence and sense of agency. This could unintentionally reduce someone's perception of  $\tilde{Y}(H)$ . [Doleac \(2019b\)](#) reviews the evidence on holistic reentry programs, including wrap-around services. Several large-scale RCTs have found that such interventions have no net benefits and in some cases actually increase recidivism rather than reduce it ([Grommon, Davidson and Bynum, 2013](#); [Cook et al., 2015](#); [Wiegand and Sussell, 2016](#); [D'Amico and Kim, 2018](#)).<sup>34</sup>

Reentry courts provide support and additional services to facilitate desistance from crime

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<sup>34</sup>Previous studies based on matched comparison groups suggested beneficial effects; this empirical approach to measuring program effects is common in this literature. The fact that those estimates are so different from the estimates based on RCTs highlights the importance of selection bias in this context ([Doleac, 2019a](#)).

for individuals on parole. An RCT compared effects of the Harlem parole reentry court with traditional parole, with a sample of 504 parolees released from prison between 2010 and 2013. As reported by [Ayoub and Pooler \(2015\)](#), there was no effect on rearrest or reconviction after controlling for initial imbalances in baseline characteristics.

Some programs specifically aim to increase social support from the community and loved ones, based on the hypothesis that such support is an important complement to individuals' efforts to desist from crime. While social support is correlated with desistance, it is unclear if (1) it has a causal effect, or (2) interventions can increase relevant forms of social support. [Pettus-Davis et al. \(2017\)](#) describes an RCT of Support Matters, a program designed to encourage involvement in positive social support networks, for people with substance abuse disorders who were recently released from prison in North Carolina. Participants were randomly assigned to that program or reentry support as usual. Seven months after assignment, there was no difference in rearrest rates across the treatment and control groups, though the sample was small (N=40). [Shamblen et al. \(2017\)](#) considered a different program with a similar focus: the Creating Lasting Family Connections Fatherhood Program (CLFCFP). Like Support Matters, CLFCFP targeted individuals with a substance abuse disorder and was designed to promote connection with family and the community. An RCT (N=280) found no significant differences in reincarceration (for a parole violation or new offense) at the 3-month followup, though on average the treatment group was reincarcerated less often (9% versus 13%).

## 5.5 Increase access to public assistance

Public assistance – cash or in-kind transfers that are not linked to work – to people with criminal records could also help them avoid criminal activity. There are two potential mechanisms: increasing  $\tilde{Y}(H)$  can reduce the incentive to commit property crimes (in order to purchase food and other necessities) and can enable individuals to stay away from peers who are negative influences (but might be a reliable source of material support).<sup>35</sup> A variety

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<sup>35</sup>A potential benefit of in-kind transfers over cash is that cash can be used to purchase drugs and alcohol, which might increase criminal behavior.

of policy changes over the years have changed offenders' eligibility for public assistance. This generates substantial variation that is useful for identifying the effects of such policies on desistance.

[Berk and Rauma \(1983\)](#) evaluate a policy change in California during the late 1970s that allowed individuals to collect unemployment benefits based on hours worked while in prison. They find suggestive evidence that access to this form of financial assistance reduced recidivism. However, an RCT that offered unemployment insurance payments to newly-released individuals in Georgia and Texas in 1976 – the Transitional Aid Research Project (TARP) – found no significant effects on re-arrest rates in the year following release ([Rossi, Berk and Lenihan, 1980](#)). Receiving the payments did reduce employment, which may have contributed to the null effects on recidivism. Another RCT of a similar program in 1971, the Baltimore LIFE Experiment, found suggestive evidence that receiving payments reduced arrests for theft, but had no effect on arrests for other types of crime ([Rossi, Berk and Lenihan, 1980](#)).

[Lovenheim and Owens \(2014\)](#) measure the effect of a federal ban on financial aid for those with drug convictions, for up to two years after the conviction. They find that these individuals delay enrolling in college by an average of two years, and there is suggestive evidence those who delay college-going are more likely to commit additional crimes during the interim period. That is, the ban appears to increase recidivism.

[Yang \(2017a\)](#) studies the effect of Section 115 of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which imposed a lifetime ban on both welfare benefits and food stamps for anyone convicted of a felony drug crime, as well as subsequent state-level laws that fully or partially opt out of this federal ban. Using a triple-differences design, Yang finds that eligibility for welfare and food stamps at the time of release from prison reduces the risk of returning to prison within a year by about 10 percent.

[Tuttle \(2018\)](#) focuses on one of these state reforms in the wake of the PRWORA – a Florida law that restricts the food stamp ban to individuals who committed a drug trafficking

offense on or after August 23, 1996. This was a lifetime ban on this form of public assistance. Using a regression discontinuity design, Tuttle finds that the ban increased recidivism among drug traffickers. This effect was driven by financially-motivated crimes, suggesting that financial hardship led to an increase in recidivism.

Palmer, Phillips and Sullivan (2019) find that emergency financial assistance for housing significantly reduces the likelihood of rearrest by 5.8 percentage points (18%), for those with at least one arrest during the previous five years.

Munyo and Rossi (2015) find that recidivism in Uruguay is highest on the first day after release from prison, and that a 2010 policy change that increased the amount of “gate money” received at the time of release (from UR\$30 to UR\$100, approximately 120% of daily income) reduced first-day recidivism from an average of 0.6 crimes per person to 0 crimes. This effect was driven by a drop in property offenses, and crime did not appear to be displaced to subsequent days.

## 6 Change peers and preferences

### 6.1 Peer effects

Spending time with people who are criminally-active can make desistance more difficult in a variety of ways. A growing number of studies show the importance of peer effects in determining desistance from crime. (Recall that negative peer effects are one possible explanation for the ineffectiveness of transitional jobs programs. See Section 5.1 for a full discussion.)

Chen and Shapiro (2007) find that being just over a risk score cutoff that places someone in a higher-security incarceration facility leads to more recidivism; they argue that is likely due to the negative peer effects of being housed with more hardened criminals.

Bayer, Hjalmarsson and Pozen (2009) use data on juvenile offenders released from correctional facilities in Florida between 1997 and 1999 to study the effect of peer inmates on their subsequent recidivism. They find that juveniles who are exposed to peers with histories of the same criminal activity are more likely to commit that offense again in the future.

In other words, peer effects appear to reinforce previous behaviors. Effects are larger for offenders in non-residential facilities, where individuals are grouped with others from nearby neighborhoods; this provides suggestive evidence that the formation of criminal networks is an important source of peers' influence (Venkatesh and Levitt, 2000). Using richer data from the same state during a later period (2006 through 2011), Stevenson (2017) finds that exposure to more high-risk peers while incarcerated increases future crime committed by juvenile offenders, and that effects are not limited to those with the same criminal histories. Her data allow her to consider three possible channels through which such peer effects may operate: criminal skill transfer, the formation of criminal networks, and the social contagion of negative attitudes and non-cognitive traits. She argues that the evidence is most consistent with the social contagion channel, suggesting that the attitudes of (at least) juvenile offenders are quite malleable and sensitive to social influences.

Other work evaluating the effects of non-carceral interventions also highlight the importance of peer effects. The lack of benefits from a day-reporting center for parolees, for instance, may be due to those parolees' spending lots of time with one another (Boyle, Ragusa-Salerno, Lanterman and Marcus, 2013). This may have cancelled out any benefits of the programming offered in those centers. Dishion and Andrews (1995) (1-year outcomes) and Poulin, Dishion and Burraston (2001) (3-year outcomes) compare high-risk teens randomly assigned to a group cognitive behavioral therapy (CBT) program with other high-risk teens, relative to those who received no intervention or a self-study CBT program. They find an increase in delinquency for those who are assigned to the group program, which they argue is the result of negative peer effects.

Several studies consider the effects of multidimensional treatment foster care (MTFC) as an alternative to placement in a group home as usual, for delinquent youth. These studies typically find beneficial effects in terms of reduced time spent in locked facilities and number of criminal referrals (see for example: Eddy, Whaley and Chamberlain, 2004; Chamberlain, Leve and DeGarmo, 2007; Leve, Chamberlain, Smith and Harold, 2012; Bergström and

Höjman, 2016). MTFC programs involve several differences from group care, but being placed in a context with less exposure to negative peer influences may be an important driver of these effects. Indeed, a core feature of the MTFC treatment is that “association with deviant peers was discouraged.” However, the small samples in these studies make it difficult to read much into the magnitudes of the effects.

Providing safe housing to people coming out of prison could help them avoid risky situations or negative influences. There is limited evidence on the effects of providing housing to this group, but two studies serve as warnings about the potential downsides of existing programs. Lee (2019) considers the effects of halfway houses for people released from prison in Iowa. Inmates were randomly assigned to case managers with differing propensities to assign inmates to this residential housing program or parole as usual. Using this as a natural experiment, the researcher found that assignment to halfway houses increased reincarceration. This was driven by an increase in technical violations of parole, which implies that the housing program involved increased supervision (see the discussion of supervision levels in Section 4), but new offenses also increased. Both of these effects could be at least partly the result of negative peer effects (living with people who were also recently-released from prison). Similarly, Oxford Houses are residential aftercare programs for recently-released offenders following drug treatment. They provide housing to participants but there are no residential staff; instead, the goal is that other residents provide supportive, sober social networks. Doleac, Temple, Pritchard and Roberts (2020) re-analyze data from an RCT comparing Oxford Houses with business as usual, and find suggestive evidence that assignment to an Oxford House led to an increase in re-incarceration (coefficients were large but statistically insignificant). Detrimental effects are consistent with the hypothesis that fellow residents were a negative influence, not a positive one.

While peer effects can affect someone’s attitudes and choices even when those peers aren’t around, a substantial share of criminal behavior may be context-specific. That is, some criminal activity is a function of participating in particular activities, with particular

people, rather than a pre-meditated plan to commit a crime. Examples include bar fights with strangers, violent behavior that results from the use of alcohol or drugs, or crimes committed with friends due to peer pressure. In these cases, changing the incentives to avoid these contexts and influences (heavy drinking, drug use, or spending time with criminally-active peers) may be more effective than changing the incentives to commit crime once someone is in such a situation. As discussed below, interventions such as CBT can help individuals learn to avoid high-risk situations and triggers.

Forcibly removing people from previous networks and situations is politically and ethically problematic but could also facilitate desistance from crime: Kirk (2015) finds that prisoners released as usual concentrate in many of the same neighborhoods; peer effects and criminogenic influences in those places may contribute to high recidivism rates. Hurricane Katrina scattered parolees to other places, and this reduction in negative peer effects appears to have reduced recidivism. Kirk finds suggestive evidence that one additional parolee per 1,000 local residents increased local reincarceration rates by about 11% (marginally significant). Finding ways to incentivize people to voluntarily leave criminally-active networks behind could have meaningful benefits in terms of breaking the incarceration cycle.

As discussed in Section 3.1, EM is an effective alternative to incarceration in many contexts. This may be due in part to reducing time spent with criminally-active peers while incarcerated. When used as part of community supervision, EM could incentivize people to stay out of high-risk situations. EM enables effective enforcement of a curfew or court orders about which places someone is allowed to go and with whom they are allowed to associate. (This effectively imposes an earlier choice on the person, before the choice to commit a crime – for instance, the choice to go to a bar with friends or not. If they don't go to the bar, they are less likely to face a choice about whether to commit a crime.) However, the existing evidence on EM measures its effects relative to incarceration; there is currently very little evidence on the effects of EM relative to less-intensive supervision.<sup>36</sup>

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<sup>36</sup>The one exception is Killias, Gilliéron, Kissling and Villettaz (2010), which describes an RCT in Switzerland comparing EM with community service – both alternatives to short incarceration spells. Randomization

Additional work on peer effects in the criminal justice context would be valuable. Many rehabilitation programs are group-based, so understanding which peers matter most – and whether it’s possible to mitigate the negative effects of deviant peers – would be extremely useful.

## 6.2 Change preferences over legal versus illegal activity

Blattman and Annan (2016) consider the possibility that employment-focused interventions can change participants’ preferences regarding legal versus illegal activity. They hypothesize that part of the gains from such programs could come from changing preferences ( $\gamma$ ), not simply from the change in the monetary payoff from legal work. They do not find evidence for changes in attitudes toward violence in their employment-focused RCT in Liberia, but changing attitudes may be an important factor in encouraging desistance more broadly. A lot of criminal activity does not directly interfere with legal work (for instance, much illegal activity happens at night while work happens during the day). For this reason, increasing legal employment does not necessarily mean forgoing illegal activity (Reuter et al., 1990). But if legal employment and all that it entails – more positive peer influences, a change in how one sees oneself – can affect the relative cost of illegal activity through a change in preferences, that is likely to have big benefits.

The hypothesis that such preferences are malleable is supported by Stevenson (2017). As discussed above, she finds that being exposed to high-risk peers while incarcerated increases recidivism through social contagion of negative attitudes and non-cognitive traits. That study suggests that spending time with more positive influences could have the opposite effect, but it is currently unclear whether such effects are linear. Does exposure to positive peers (through, for instance, the social support interventions described in Section 5.4) have big benefits, or does most of the gain come from reducing exposure to high-risk peers? More research on this would be useful.

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to EM (which included a curfew) instead of community service had no significant effect on recidivism, but may have increased marriage and reduced poverty over the subsequent three years (the sample was small, and results were only marginally significant).

Programs that focus on moral development aim to shift participants' preferences to value non-criminal activity. A prison-based program that grouped participants together in a special youth unit, emphasizing moral development as well as distancing oneself from delinquent peers, had no effect on desistance (Armstrong, 2003). It may be that grouping young offenders together increased negative peer effects that counteracted any benefits of the program. In contrast, a community-based diversion program for non-violent young offenders that involved reading books that emphasized 'virtue theory' in a group setting dramatically reduced reoffending (Seroczynski et al., 2016). The effect of this program may be due in part to the mentorship of group leaders rather than the nature of the readings, though the mechanism (changing attitudes and preferences,  $\gamma$ ) could be the same.

Restorative justice aims to help offenders develop empathy for victims and understand the social costs of their actions. This could in turn change their preferences toward illegal activity. Mills, Barocas and Ariel (2013) studied the effects of restorative justice in the domestic violence context, using an RCT in Arizona. Cases were randomly assigned to a traditional group-based therapy for domestic batterers or a restorative justice program called Circles of Peace. Effects are imprecisely estimated but both ITT and TOT effects suggest large reductions in rearrests during the 12-month followup. Sherman, Strang and Woods (2000) compare restorative justice conferences (instead of court as usual) in Australia using an RCT. They find that restorative justice reduced recidivism for violent offenders, but results were preliminary and did not include the full sample of participants. They found no effect on other types of offenders for whom the full sample was included: drunk drivers, juvenile property offenders, and juvenile shoplifters. A subsequent study (Tyler et al., 2007) conducted a two-year followup for the drunk driver sample only, and confirmed that the restorative justice intervention had no effect on recidivism. There does not appear to have been any followup study of the violent offender sample.

## 7 Improve ability to make welfare-maximizing choices

A large share of criminal behavior may be a result of mental illness or substance abuse. In these cases, it is likely that individuals are not making rational, welfare-maximizing decisions about their own behavior. Interventions that help them align their preferences with their actions may have several benefits, including increasing desistance from crime.

For instance, addiction to alcohol and drugs can lead to criminal behavior, such as theft to support a drug habit or violent assaults due to physiological response to the drug. [Bernheim and Rangel \(2004\)](#) and [Bernheim and Rangel \(2005\)](#) describe an economic model of addiction that posits that substance use is sometimes rational and sometimes a “cue-triggered mistake.” Interventions such as behavioral therapy can teach techniques to avoid triggers, thereby helping patients learn how to manage their addictions. Similarly, medication-assisted treatment (MAT), such as methadone for opioid addiction, can help people manage cravings without detrimental consequences; if substance use is a mistake, then MAT serves as a commitment device that helps an addict avoid such mistakes. Interventions like these could help individuals desist from crime, if criminal behavior is a by-product of their addiction. Unfortunately the empirical evidence on the effects of such interventions on desistance is currently too thin to draw any conclusions.<sup>37</sup>

A primary challenge is getting people to voluntarily participate in programs that could be effective. As discussed above, incarceration provides an opportunity to mandate treatment for individuals who would not voluntarily engage in such programs. But it would be helpful to find ways to encourage engagement outside of jail and prison. Interventions designed

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<sup>37</sup>A few existing studies are either based on very small samples or compare different treatments rather than measuring the effect of the treatment with a control of no treatment. See for example, [Dole et al. \(1969\)](#), [Kinlock, Gordon, Schwartz and O’Grady \(2008\)](#), [Schwartz \(2009\)](#), [Lobmaier, Kunoe, Gossop and Katevoll \(2010\)](#), [Lee et al. \(2015\)](#), [Gordon et al. \(2017\)](#). One of the larger studies, [Dolan et al. \(2005\)](#) (N=382), compares individuals initially randomly assigned to a methadone maintenance program while incarcerated in New South Wales, with a control group that was offered the same treatment 5 months later. The follow-up study therefore measures the effect of the 5-month lead time. There was no significant difference between the two groups in re-incarceration rates 4 years after initial assignment, though the treatment group did worse on average. However, this study does not tell us what the effect of methadone maintenance treatment is relative to a counterfactual of no such treatment. Additional research in this area would be extremely valuable.

to incentivize participation in community treatment have had disappointing effects. For instance, [Prendergast et al. \(2015\)](#) and [Hall, Prendergast and Warda \(2017\)](#) report the effects of an experiment in Los Angeles where parolees were randomly assigned to receive (1) financial incentives to enroll in and attend community substance abuse treatment (consisting of residential and outpatient programs), or (2) a brief education session. The financial incentives were moderate (participants had the potential to earn \$882.50 over the 22-week intervention), but had no effect on treatment retention. Eighteen months after assignment, there was no significant difference in arrest rates across the two groups. Intensive case management programs aimed at facilitating engagement in treatment have been similarly disappointing, when rigorously evaluated (see [Guydish et al., 2011](#) and [Scott and Dennis, 2012](#)).

Drug courts are often proposed as an alternative to traditional courts for those with substance abuse histories. Such programs are promising but it is not yet clear whether the benefits outweigh the costs. For instance, [Deschenes, Turner and Greenwood \(1995\)](#) evaluate the effects of the Maricopa County drug court in the early 1990s. Low-level, first-time drug felons were randomly assigned to the drug court or standard probation (N=630). During the 12-month followup period, being assigned to the drug court had no significant effect on the likelihood of a new arrest, conviction, or reincarceration. Probationers in the treatment group are more likely to be reincarcerated in jail instead of prison, however; this suggests more minor offenses and perhaps some cost savings, but the effect on days incarcerated is not reported. In a separate study, drug offenders in Baltimore in the late 1990s were randomly assigned to a drug court that combined frequent drug tests with substance abuse treatment, or treatment as usual. Drug court assignment resulted in a reduction in new charges, but no change in total days incarcerated ([Gottfredson, Najaka and Kearley, 2003](#)). Neither study included a cost-benefit analysis.

[Prins et al. \(2015\)](#) evaluates an RCT of drug courts across several sites in Oregon. The drug courts provide team-based services and support to those whose criminal behavior is

related to drug use. Study participants were medium- to high-risk property and drug offenders, with a documented drug dependency. The treatment group was assigned to an intensive drug court, while the control group received parole as usual. One year after assignment, the treatment group had significantly fewer felony and drug charges. There is no formal cost-benefit analysis, but drug court assignment cost \$21,000 per person, on average – substantially more than standard parole. Unless the avoided offenses were serious and would have involved lengthy incarcerations, it seems unlikely that the benefits of drug courts would exceed the costs. An analysis of the impact of treatment assignment on the social costs of crime as well as days incarcerated would be necessary to determine cost-effectiveness.

Regardless of the cost-effectiveness of these existing drug courts, it is unclear how easy it would be to scale up this type of intervention. Effects will likely depend heavily on judges' rapport with clients as well as the quality of the entire drug court team.

Jones (2013) evaluated the effects of intensive supervision versus supervision as usual, both within the context of an Australian drug court in 2010 and 2011 (N=160). (The drug court itself was an alternative to prison; it involves MAT and group therapy.) For this sample of high-risk, drug-involved offenders, more intensive supervision reduced positive drug tests and sanctions received, though longer-term outcomes on recidivism were not available.

Therapeutic communities (TCs) are a highly-structured form of long-term residential treatment for substance abuse, with a focus on self-help, group support, and mentoring. A small number of well-identified studies have measured the impact of TCs for inmates and recently-released offenders. Effects on desistance are mixed.<sup>38</sup>

More formal, clinical therapy, alone and in combination with medication, can facilitate better decision-making to support long-term behavioral change, for those with and without substance use disorders. Therapy may teach strategies to avoid high-risk situations and triggers, and help patients correct the perceived costs and benefits of certain behaviors so that they are more in line with reality. A number of studies support the hypothesis that

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<sup>38</sup>See for example Sacks et al. (2012); Sacks, McKendrick and Hamilton (2012); Welsh, Zajac and Bucklen (2014); and Doleac, Temple, Pritchard and Roberts (2020).

therapy can support desistance from crime.<sup>39</sup>

Ortmann (2000) reports the results of an experiment in Germany, where 228 inmates who had applied for social-therapeutic treatment were assigned to either a social-therapeutic facility or a regular prison during the 1990s. On average, those assigned to the facility emphasizing social-therapeutic treatment have a substantially lower recidivism rate over the 5-year followup period (an 11% reduction in the likelihood of more than 3 months' imprisonment or equivalent fines), but this effect is not statistically significant.

Hjalmarsson and Lindquist (2020) consider the effects of Swedish policies that changed the amount of time served in prison, and found that more time in prison had beneficial effects on offenders' long-term health and mortality. The effects are due in part to reductions in suicide, which highlights the potential benefits of mental health treatment during incarceration.

Violence-intervention programs (VIPs) are comprehensive interventions aimed at convincing individuals at risk of violent crime (and life-threatening injury) to desist from violence. This often involves helping participants leave gangs. It involves case management and therapy that teaches non-violent problem-solving skills; it may also involve referrals to other services and health care (including mental health care). By aiming to improve participants' outside options, including education and employment, they might also operate by increasing  $\tilde{Y}(H)$ . Three such programs are Ceasefire, Save Our Streets, and Cure Violence; all have been evaluated using neighborhood-level difference-in-difference analyses of crime rates. Those evaluations provide suggestive evidence that overall violent crime fell, but it is unclear whether the comparison areas (those that did not choose to adopt the program) represent good counterfactuals for the treated areas (see for example Webster, Whitehill, Vernick and Parker, 2012; Picard-Fritsche and Cerniglia, 2013; Delgado et al., 2017). Rigorous studies of

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<sup>39</sup>However, even if some therapeutic approaches work, this does not mean that all such approaches will be effective, or that they will be effective in all contexts. For instance, D'Amico et al. (2013) finds that motivational interviewing with substance-involved youth (relative to a usual care) in a teen court setting had no effect on desistance.

VIPs based on individual-level interventions and administrative data would be valuable.<sup>40</sup>

Cognitive behavioral therapy (CBT) is a form of psychotherapy that helps patients identify negative or inaccurate thinking so that they can respond to challenges in a more effective way. Several rigorous studies using RCTs to evaluate CBT interventions find benefits in terms of increased desistance from crime (van Voorhis et al., 2004; Pearson et al., 2016; Barnes, Hyatt and Sherman, 2017; Heller et al., 2017). However, not all CBT-based interventions are successful, highlighting the importance of implementation details (Bahr, Cherrington and Erickson, 2016).

Multisystemic therapy (MST) is a form of mental health treatment that includes family and the community of targeted youth, for a more comprehensive approach to rehabilitation. It is highly related to other forms of family-based therapy, including Functional Family Therapy (FFT). Several evaluations based on RCTs and natural experiments have found that MST and related programs reduce recidivism for court-involved youths, as well as their siblings and caregivers (Schaeffer and Borduin, 2005; Glisson et al., 2010; Sawyer and Borduin, 2011; Butler, Baruch, Hickey and Fonagy, 2011; Smith, 2011; Dopp, Borduin, Wagner and Sawyer, 2014; Cuellar and Dave, 2016; Johnides, Borduin, Wagner and Dopp, 2017).<sup>41</sup> However, several other studies, including a recent large-scale RCT of MST in England, found no beneficial effects (Dembo et al., 2000; Olsson, 2010; Asscher et al., 2014; de Vries, Hoeve, Asscher and Stams, 2018; Fonagy et al., 2018).

These mixed results suggest that MST has potential but effects may be context-specific and could depend heavily on the quality of the therapists. Since treatment effects are measured relative to “treatment as usual,” the baseline level of available health care and mental

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<sup>40</sup>Cooper, Eslinger and Stolley (2006) describe an RCT of a VIP conducted between 1999 and 2001 in Baltimore. The sample is small (N=100), and appears to suffer from substantial attrition during the follow-up period (only one-third of participants were followed for two years). While the study finds that the treatment group is much less likely to be arrested or convicted during the followup period, outcome data appear to be based on survey responses, where non-random attrition would be an important problem. There is no discussion of this in the study.

<sup>41</sup>Note that several of these were based on the same experiment in Missouri in the late 1980s: Schaeffer and Borduin (2005); Sawyer and Borduin, 2011; Dopp, Borduin, Wagner and Sawyer, 2014; Johnides, Borduin, Wagner and Dopp, 2017. Others are substantially underpowered: Smith (2011).

support services is also important. Additional evaluations in other contexts, and including cost-benefit analyses, would be helpful.

## 8 Summary and discussion

Finding interventions that can reduce recidivism and improve other outcomes, for those who have committed crime in the past, is a top policy priority in many countries. In this review, I summarize well-identified empirical studies on the effects of interventions imposed on people with criminal records, on the subsequent behavior of those individuals. I group the relevant studies into broad categories based on the type of treatment(s) imposed.

There is a lot we don't know about what happens to people before and after they are involved with the criminal justice system, and this lack of knowledge hampers research in this area. Increasing access to administrative data on people with criminal records – and facilitating linkages of those datasets with data on employment and education, for instance – would increase researchers' ability to measure the effectiveness of various interventions on individual offenders' outcomes, and hone in on the precise mechanisms driving any effects.

As in all empirical work, understanding the the external validity of individual studies is important. A program that works in some places may not work in others, for a variety of reasons. Funders and journals should incentivize the replication of past evaluations in different contexts, and with larger populations (thus measuring whether effects decline as the program scales up).

There are many open questions in this space, but the existing literature provides valuable information to guide future research and policy. I summarize the evidence on each intervention category below, and in Tables 1 - 5. I also discuss some promising directions for future research in each category, though these discussions are not intended to be comprehensive and many other avenues for interesting academic inquiries exist.

### **Changing the punishment, s:**

***Summary of current evidence:*** The effect of a direct punishment is the combination of any specific deterrent, criminogenic, and incapacitation effects. Two studies find that

increasing non-carceral punishments such as fines or probation (in the context of DUI and traffic offenses) has a net deterrent effect on reoffending, which implies a beneficial specific deterrent effect. Similarly, replacing short prison sentences or pre-trial detention with electronic monitoring has net benefits, presumably because it avoids the criminogenic effects of jail or prison and prevents interruptions to beneficial activities such as work. Increasing carceral punishments (jail or prison sentences) for those on the margin has mixed effects on future offending and employment. We don't yet understand what is driving these mixed effects – differences in who makes up the marginal population, differences in the treatment (prison programming or conditions), or both. Two studies highlight that time served relative to the initial, expected sentence matters: widening the gap between the two increases recidivism, apparently because it reduces the perceived cost of punishment. The evidence on graduated sanctions programs is also mixed, and interventions that had benefits typically had other components that may have driven the effect. The evidence on focused deterrence programs (targeting threats of punishment along with increased outside options) is too thin to draw any conclusions; only one well-identified study exists, and it is underpowered. Adding 'collateral consequences' that come with particular convictions, such as the stigma of a felony conviction or restricting future eligibility for public assistance, appears to increase recidivism, perhaps by reducing the effective punishment for subsequent offenses (once someone has been banned from particular jobs or types of assistance, they cannot be banned again).

***Directions for future work:*** We need to understand the reasons for different estimates of the marginal effect of incarceration. Are these differences driven by different marginal populations, or different treatments (relative to the counterfactual), or both? In addition, are what are the social costs or benefits to the families and communities of those who are punished? Since incarceration can have important criminogenic effects that cancel out the specific deterrent and incapacitation effects, it would be helpful to have more work on alternatives such as electronic monitoring, that avoid those criminogenic effects (but may

reduce the incapacitation effect). More research on focused deterrence programs – which are popular but currently not supported by rigorous evidence – could also be valuable.

#### **Changing the probability of punishment, $p$ :**

*Summary of current evidence:* DNA databases provide the cleanest test of the effect of increasing the probability of punishment, and there is strong evidence that this reduces recidivism across a wide range of offenders. Other interventions that include increasing  $p$  – such as increasing the intensity of community supervision or SCF programs for those on probation or parole – have more mixed effects. This suggests that the other components of those programs are canceling out the benefits we might see from increasing  $p$  alone.

*Directions for future work:* We do not yet understand how changing the probability of punishment affects individuals' perceptions of that probability. This matters for policy, particularly if we want to trade increases in the probability of punishment for reductions in punishment severity (to reduce incarceration rates). It would also be helpful to test the effectiveness of SCF programs – which combine drug testing with short, immediate penalties for failed tests – separately for those with and without histories of substance use disorders.

#### **Changing the non-criminal outside option, $\tilde{Y}(\mathbf{H})$ :**

*Summary of current evidence:* Overall, improving non-crime options appears to reduce recidivism, but interventions vary widely in their effectiveness. Providing public assistance (welfare, food stamps) reduces recidivism; cash assistance has had more mixed effects, but evaluations of more recent interventions show beneficial effects, and increasing the pay associated with low-skilled jobs is also beneficial. However, giving people a job does not consistently reduce recidivism or improve post-program employment outcomes. This suggests that changing how people spend their time is not beneficial, at least in the context of a program where they are working alongside other hard-to-employ individuals. Ban the Box programs are typically not effective and have important unintended costs. There is some evidence that rehabilitation certificates increase access to jobs, perhaps by shifting legal risk from the employer to the courts. Wrap-around services that provide a variety of services

aimed at supporting the client in finding and keeping a job and avoiding criminal activity, are not effective as currently implemented and in some cases do more harm than good. The evidence on other interventions (such as education, vocational training, and occupational licenses) is thin.

***Directions for future work:*** What drives the puzzling finding that a strong local labor market reduces recidivism, but giving people (transitional) jobs does not? Is the difference the amount of money earned, peer effects from coworkers, resources available from friends and family, or something else? When it comes to convincing employers to hire people with criminal records, it will be important to figure out what their specific concerns are, and how to address them. We need more evidence on the effectiveness of educational programming and vocational training, which aim to increase non-criminal capital for those with criminal records. We also need more evidence on the effects of relaxing occupational license restrictions that could make more jobs available to people with criminal records; existing work suggests that doing so could have unintended negative effects that will be important to understand.

#### **Changing peers and preferences, including $\gamma$ :**

***Summary of current evidence:*** There is consistent evidence on the importance of peers in influencing future criminal behavior. The precise mechanism varies (criminal skill transfer, the formation of criminal networks, and/or the social contagion of negative attitudes and non-cognitive traits), but a variety of studies show that being grouped with criminal peers while incarcerated or in other programs can increase recidivism. There is some evidence that the social contagion of negative attitudes is important. This poses an important policy challenge, as many interventions (such as CBT or job training programs) are provided in group settings. Changing preferences and attitudes for the better, through direct programming, has so far been mostly unsuccessful.

***Directions for future work:*** Since most interventions involve a group component due to time or budget constraints (e.g. job training, CBT), so understanding how to en-

courage positive peer effects and mitigate negative peer effects – particularly when it comes to changing antisocial attitudes – will be important for maximizing the benefits of these programs.

**Improving the ability to make welfare-maximizing choices:**

*Summary of current evidence:* There is substantial evidence that cognitive behavioral therapy is effective at reducing recidivism. Evidence on multisystemic therapy is more mixed. In both cases we still don't understand which groups benefit most from these therapy programs or how best to scale them to serve larger populations. Interventions that aim to increase participation in drug treatment programs are so far ineffective. Drug courts (as an alternative to regular courts) have shown benefits in some cases, but it is unclear if they are cost-effective. There is little evidence on specific interventions such as medication-assisted treatment for the justice-involved population.

*Directions for future work:* We need much more research on the effectiveness of specific treatment programs for people with substance use disorders, during and after incarceration. For interventions that do have an evidence base (such as CBT and MST), it will be important to understand which types of people benefit most and how to scale the programs to serve broader populations effectively. It will also be important to figure out how to get people who could benefit from a particular intervention to engage in it voluntarily (and not only when incarcerated, for instance).

Table 1: Summary of studies reviewed: Direct punishment

<b>Treatment</b>	<b>Summary of literature</b>
Increase the punishment	<p>The effect of a direct punishment is the combination of any specific deterrent, criminogenic, and incapacitation effects. Two studies find that increasing non-carceral punishments such as fines or probation (in the context of DUI and traffic offenses) has a net deterrent effect on reoffending, which implies a beneficial specific deterrent effect. Similarly, replacing short prison sentences or pre-trial detention with electronic monitoring has net benefits, presumably because it avoids the criminogenic effects of jail or prison and prevents interruptions to beneficial activities such as work. Increasing carceral punishments (jail or prison sentences) for those on the margin has mixed effects on future offending and employment. We don't yet understand what is driving these mixed effects – differences in who makes up the marginal population, differences in the treatment (prison programming or conditions), or both. Two studies highlight that time served relative to the initial, expected sentence matters: widening the gap between the two increases recidivism, apparently because it reduces the perceived cost of punishment. The evidence on graduated sanctions programs is also mixed, and interventions that had benefits typically had other components that may have driven the effect. The evidence on focused deterrence programs (targeting threats of punishment along with increased outside options) is too thin to draw any conclusions; only one well-identified study exists, and it is underpowered. Adding 'collateral consequences' that come with particular convictions, such as the stigma of a felony conviction or restricting future eligibility for public assistance, appears to increase recidivism, perhaps by reducing the effective punishment for subsequent offenses (once someone has been banned from particular jobs or types of assistance, they cannot be banned again).</p>
<b>Intervention</b>	<b>Relevant studies</b>
Non-carceral punishment Incarceration	<p>Hansen (2015); Gehrsitz (2017) Kling (2006); Hjalmarsson (2009b); Abrams (2010); Green and Winik (2010); Mueller-Smith (2015); Loeffler and Grunwald (2015); Aizer and Doyle (2015); Mitchell, Cochran, Mears and Bales (2017); Bhuller, Dahl, Løken and Mogstad (2020); Eren and Mocan (2019); Estelle and Phillips (2018)</p>
Prison conditions Time served relative to expected sentence Electronic monitoring	<p>Drago, Galbiati and Vertova (2011) Bushway and Owens (2013); Monnery (2016) Killias, Gilliéron, Kissling and Villettaz (2010); di Tella and Schargrotsky (2013); Andersen and Andersen (2014); Henneguelle, Monnery and Kensey (2016); Larsen (2017)</p>
Graduated sanctions	<p>Harrell and Roman (2001); Marvell and Moody (2001); Helland and Tabarrok (2007); Drago, Galbiati and Vertova (2009); Mueller-Smith and Schnepel (2020)</p>
Focused deterrence Collateral consequences	<p>Hamilton, Rosenfeld and Levin (2018) Lovenheim and Owens (2014); Yang (2017a); Tuttle (2018); Mueller-Smith and Schnepel (2020)</p>

Table 2: Summary of studies reviewed: Probability of punishment

<b>Treatment</b>	<b>Summary of literature</b>
Increase probability of punishment	DNA databases provide the cleanest test of the effect of increasing the probability of punishment, and there is strong evidence that this reduces recidivism across a wide range of offenders. Other interventions that include increasing $p$ – such as increasing the intensity of community supervision or SCF programs for those on probation or parole – have more mixed effects. This suggests that the other components of those programs are canceling out the benefits we might see from increasing $p$ alone.
<b>Intervention</b>	<b>Relevant studies</b>
DNA databases	Doleac (2017); Anker, Doleac and Landersø (2019)
Community supervision	Turner, Petersilia and Deschenes (1992); Turner and Petersilia (1992); Lane, Turner, Fain and Sehgal (2005); Hennigan et al. (2010); Barnes, Hyatt, Ahlman and Kent (2012); Boyle, Ragusa-Salerno, Lanterman and Marcus (2013); Georgiou (2014); Hyatt and Barnes (2017); Lee (2019)
SCF programs (targeting those with substance use disorders)	Grommon, Cox, Davidson and Bynum (2013); Kilmer, Nicosia, Heaton and Midgette (2013); Nicosia, Kilmer and Heaton (2016); Doleac, Temple, Pritchard and Roberts (2020)
SCF programs (not targeted)	Hawken and Kleiman (2009); Hawken and Kleiman (2011); Hawken et al. (2016); Lattimore et al. (2016); Davidson, King, Ludwig and Raphael (2019)
Drug testing	Haapanen and Britton (2002); Kilmer (2008)

Table 3: Summary of studies reviewed: Outside option

<b>Treatment</b>	<b>Summary of literature</b>
Improve the outside option	Overall, improving non-crime options appears to reduce recidivism, but interventions vary widely in their effectiveness. Providing public assistance (welfare, food stamps) reduces recidivism; cash assistance has had more mixed effects, but evaluations of more recent interventions show beneficial effects, and increasing the pay associated with low-skilled jobs is also beneficial. However, giving people a job does not consistently reduce recidivism or improve post-program employment outcomes. This suggests that changing how people spend their time is not beneficial, at least in the context of a program where they are working alongside other hard-to-employ individuals. Ban the Box programs are typically not effective and have important unintended costs. There is some evidence that rehabilitation certificates increase access to jobs, perhaps by shifting legal risk from the employer to the courts. Wrap-around services that provide a variety of services aimed at supporting the client in finding and keeping a job and avoiding criminal activity, are not effective as currently implemented and in some cases do more harm than good. The evidence on other interventions (such as education, vocational training, and occupational licenses) is thin.
<b>Intervention</b>	<b>Relevant studies</b>
Transitional jobs	Uggen (2000); Uggen and Shannon (2014); Cook et al. (2015); Valentine and Redcross (2015); Barden et al. (2018)
Vocational training	Farabee, Zhang and Wright (2014); Schaeffer et al. (2014)
Job placement services	Farabee, Zhang and Wright (2014)
Prison programming	Kuziemko (2013); Landersø (2015)
Boot camp	Bottcher and Ezell (2005); Bierie (2009)
Minimum wage	Beauchamp and Chan (2014); Agan and Makowsky (2018)
Earned income tax credit	Agan and Makowsky (2018)
Ban the Box	Jackson and Zhao (2017); Agan and Starr (2018); Marchingiglio (2019); Doleac and Hansen (2020); Rose (2020); Craigie (2020); Sherrard (2020)
Rehabilitation certificates	Leasure and Stevens Andersen (2016); Leasure and Martin (2017)
Occupational license restrictions	Denver (2017); Denver, Siwach and Bushway (2017); Blair and Chung (2018); Marchingiglio (2019)
Salience of job availability	Galbiati, Ouss and Philippe (2020)
Wrap-around services	Grommon, Davidson and Bynum (2013); Cook et al. (2015); Wiegand and Sussell (2016); D'Amico and Kim (2018)
Reentry courts	Ayoub and Pooler (2015)
Social/family support	Pettus-Davis et al. (2017); Shamblen et al. (2017)
Cash assistance	Rossi, Berk and Lenihan (1980); Berk and Rauma (1983); Munyo and Rossi (2015)
In-kind transfers	Lovenheim and Owens (2014); Yang (2017a); Tuttle (2018); Palmer, Phillips and Sullivan (2019)

Table 4: Summary of studies reviewed: Peers and preferences

<b>Treatment</b>	<b>Summary of literature</b>
Change peers and preferences	There is consistent evidence on the importance of peers in influencing future criminal behavior. The precise mechanism varies (criminal skill transfer, the formation of criminal networks, and/or the social contagion of negative attitudes and non-cognitive traits), but a variety of studies show that being grouped with criminal peers while incarcerated or in other programs can increase recidivism. There is some evidence that the social contagion of negative attitudes is important. This poses an important policy challenge, as many interventions (such as CBT or job training programs) are provided in group settings. Changing preferences and attitudes for the better, through direct programming, has so far been mostly unsuccessful.
<b>Intervention</b>	<b>Relevant studies</b>
Peer effects while incarcerated	Chen and Shapiro (2007); Bayer, Hjalmarsson and Pozen (2009); Stevenson (2017)
Group programming	Dishion and Andrews (1995); Poulin, Dishion and Burraston (2001); Boyle, Ragusa-Salerno, Lanterman and Marcus (2013)
Residential housing	Lee (2019); Doleac, Temple, Pritchard and Roberts (2020)
Neighborhood effects	Kirk (2015)
Multidimensional Treatment Foster Care	Eddy, Whaley and Chamberlain (2004); Chamberlain, Leve and DeGarmo (2007); Leve, Chamberlain, Smith and Harold (2012); Bergström and Højman (2016)
Employment-focused interventions	Blattman and Annan (2016); Cook et al. (2015); Valentine and Redcross (2015); Barden et al. (2018)
Moral development program	Armstrong (2003); Seroczynski et al. (2016)
Restorative justice	Sherman, Strang and Woods (2000); Tyler et al. (2007); Mills, Barocas and Ariel (2013)

Table 5: Summary of studies reviewed: Ability to make welfare-maximizing choices

<b>Treatment</b>	<b>Summary of literature</b>
Improve ability to make welfare-maximizing choices	There is substantial evidence that cognitive behavioral therapy is effective at reducing recidivism. Evidence on multisystemic therapy is more mixed. In both cases we still don't understand which groups benefit most from these therapy programs or how best to scale them to serve larger populations. Interventions that aim to increase participation in drug treatment programs are so far ineffective. Drug courts (as an alternative to regular courts) have shown benefits in some cases, but it is unclear if they are cost-effective. There is little evidence on specific interventions such as medication-assisted treatment for the justice-involved population.
<b>Intervention</b>	<b>Relevant studies</b>
Encourage participation in drug treatment	Guydish et al. (2011); Scott and Dennis (2012); Prendergast et al. (2015); Hall, Prendergast and Warda (2017)
Drug courts	Deschenes, Turner and Greenwood (1995); Gottfredson, Najaka and Kearley (2003); Prins et al. (2015)
Intensive supervision in drug court	Jones (2013)
Therapeutic communities	Sacks et al. (2012); Sacks, McKendrick and Hamilton (2012); Welsh, Zajac and Bucklen (2014); Doleac, Temple, Pritchard and Roberts (2020)
Prison programming	Ortmann (2000); Hjalmarsson and Lindquist (2020)
Cognitive behavioral therapy	van Voorhis et al. (2004); Pearson et al. (2016); Bahr, Cherrington and Erickson (2016); Barnes, Hyatt and Sherman (2017); Heller et al. (2017)
Multisystemic therapy	Dembo et al. (2000); Schaeffer and Borduin (2005); Glisson et al. (2010); Olsson (2010); Sawyer and Borduin (2011); Butler, Baruch, Hickey and Fonagy (2011); Smith (2011); Dopp, Borduin, Wagner and Sawyer (2014); Asscher et al. (2014); Cuellar and Dave (2016); Johnides, Borduin, Wagner and Dopp (2017); de Vries, Hoeve, Asscher and Stams (2018); Fonagy et al. (2018)
SCF programs (for those with substance use disorders)	Hawken and Kleiman (2009); Hawken and Kleiman (2011); Grommon, Cox, Davidson and Bynum (2013); Kilmer, Nicosia, Heaton and Midgette (2013); Nicosia, Kilmer and Heaton (2016); Lattimore et al. (2016); Davidson, King, Ludwig and Raphael (2019); Doleac, Temple, Pritchard and Roberts (2020)

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